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There Can Be No Marking Time in the Telephone Industry

Barring a few spots, business has kept up extremely well this year, notwithstanding the tendency of some interests to hold back plans because of the fear that a business depression is likely to come in a "presidential year." Now, with the election less than two months away, these waiting buyers are waking up to the fact that they are losing time, and they are getting busy.

This is true in the telephone field as elsewhere. Reports show that companies that have postponed extensions on the theory that politics would slow things up are now moving ahead with plans of development. It is strange that even experienced telephone men, who should know better, forget that the telephone business steadily grows on, regardless of whether times are good or bad. There can be no marking time. Fluctuations in general business do not injure the telephone industry to the same degree.

The telephone business is a good business. The truth of this oft-repeated statement is demonstrated every day by the mail that passes through Telephony's office, for shortly after a telephone owner sells his property he is sure to write in to say that he wants to get back into the business and to ask where he can secure another location.

* * * *

There is a warning on the records of the Wisconsin Railroad Commission for the telephone company which, for one reason or another, is dilatory in making the extensions demanded by the public. Not even because it is a "presidential year" should the service company neglect the orders for additional telephones.

In passing on a recent case, the Wisconsin commission announced this principle in these significant words:

"The commission wishes to make it clear that no excuse can be sufficient for failure to make installations of telephone promptly, and for failure to take care of moves and changes required by customers.

"The management will be expected and required to take care of such matters, as well as routine service matters, with promptness and dispatch; and any complaints which come to the commission indicating that this requirement is not being fulfilled will be vigorously dealt with."

* * * *

Along this same line of thought as to the steady development of the telephone industry—and the mistake of postponing improvements and extensions—are some ideas advanced by an observer in the telephone manufacturing field. Commenting on current general business forecasts, he remarked:

"Regardless of how these experts may differ as to the probable future of such lines as the automobile business, the steel business, or the meat-packing business, they are all quite agreed on one thing. That is the telephone business. The history of the telephone industry since its beginning has shown a consistent and steady gain which has seemingly been affected hardly at all by panics, wars or 'lean' years.

"Probably no other industry is influenced so little by outside economic conditions as is the industry of telephone communication. As a consequence, it is almost as certain as day and night that, in our present state of commercial development, the use of the telephone and the demand for telephone service will continue to increase steadily for many years to come.

"In fact, it is difficult to foresee even in the far distant future a time when the demand for telephone service will cease to grow, since as both business and social life continue to grow more complex as civilization advances, the need of more facilities for telephone communication continues to increase."

By way of amplifying the idea, in connection with the growth in population, he said: "In the last ten years the number of people in the United States has increased by 20,000,000. Merely to take care of the added number of telephones necessary to provide for the normal growth in population means a constant, steady expansion for the industry.

* * * *

"Another factor which influences telephone demand, and which is constantly at work in the United States, is the increasing prosperity of all classes of workers and the growth of the wealth of the country. This factor continually brings more and more people into a condition finan-

cially where they can afford to have telephones where they couldn't before, and also where they have more leisure time in which to use them.

"Thus it is seen that under normal conditions of development of the country, the point of saturation for telephones and telephone service is virtually never reached; or, at least, it is inconceivable that it could be possibly reached within the life time of anyone who may read these lines."

* * * *

"Another peculiarity about the telephone business, which is an important factor in the constancy of growth which it evidences, regardless of what other industries are doing," continued this observer, "is the fact that as other businesses may become poor for various economic reasons, the telephone business becomes better because of this very condition.

"For instance, a grocery store whose trade starts to fall off, installs an extra telephone for one of its clerks to use in soliciting additional business over the wire. A coal company increases its use of the long distance service in order to stimulate business with out-of-town customers. In countless other ways the telephone proves itself just as necessary and useful in times of business depression as during the more prosperous periods, if not more so.

"The point I want to make is, that those engaged in the telephone business are in one of the most stable and steadily-growing businesses in America. Recognition should be given this fact by telephone executives who should realize that modernization and improvement of their plants should be carried forward continually. Otherwise their properties will become inadequate for modern needs."

COMING CONVENTIONS.

The Telephone Association of Maine, Portland, Falmouth Hotel, September 18 and 19.

United States Independent Telephone Association, Chicago, Hotel Sherman, October 16, 17, 18 and 19.

Independent Pioneer Telephone Association of the United States, Chicago, Hotel Sherman, October 18.

Illinois Telephone Association, Hotel Abraham Lincoln, Springfield, November 8 and 9.

Some interesting figures as to the amount of money invested in public service companies are found in a survey made by Bonbright & Co., a New York investment house. They show that nearly 26 billion dollars are invested in the utility business, and that the number of stock and bondholders is more than 2,000,000.

This vast sum is divided by the survey as follows: Electric light, power and gas companies, 12½ billions; electric railways, 6 billions; telephone and telegraph companies, 3.8 billions; water supply companies, 3½ billions.

* * * *

The vital importance of these services to the general public is now universally recognized, which fact makes the securities of the companies engaged in the business listed as gilt-edged by all who are experienced in handling capital in the nature of trust funds such as banks, insurance companies, and the like. More and more these funds are being invested in public service securities, for the utility companies, under state regulation and properly managed, are no longer business risks but really established institutions.

Supervising Telephone Toll Service

Grade of Service Rendered Depends on the Supervision—Arrangement of Tickets Has Important Bearing on Speed of Service—Supervisors Should Assist Operators—Address From Traffic Conference of Iowa Convention

By Miss Bess Peterson,

Chief Operator, Marshall Telephone Co., Marshalltown, Iowa

Supervision plays a most important part in all lines of work. Success depends on proper supervision. In telephone work the only commodity produced and sold is service, and we in the traffic department are engaged in the manufacturing of such service. The grade of service given, whether local or long distance, depends on the supervision.

We have toll service to sell and when a customer comes, do we sell him our goods? If we do not make the sale, it is up to the one superintending the traffic department to find out the reason.

Not being able to sell may be due to any of several causes—insufficient equipment, shortage of help, or equipment trouble. Whatever is the reason, the person responsible for the service must learn the cause and find remedies. We must continue to sell and not turn away our customers.

When we go into a store intending to make a purchase, we may buy or we may not. But at the close of the day the manager does not know how many sales were lost, or for what reason no sale was made. We, however, have a way of knowing and, therefore, can continue to improve our sales by using the reports on tickets for information.

Study your cancelled calls! What happened yesterday that you should be on the look-out for today?

I remember just before C. L. R. operating came into effect, calls were often cancelled to our tributaries for such reasons as, "Does not care to talk now; party just drove in," or "Party is here now." It would be a few minutes only after the call was filed. Now, we can hold the subscriber on the line, and as a result have almost overcome the cancellation of such calls.

The operator's orders are to work with speed on an outgoing call to our tributary or from our tributary into Marshalltown, so that the subscriber will not have time to glance out of the window and look for persons whom they were calling—and there is the postman who might deliver a letter causing the cancellation of a call by bringing delayed information.

The principal feature by which toll service is judged by the subscriber is speed; and now, since this has become such an important part of our toll work, we must see that toll calls are passed with the least possible delay.

The effect of the arrangements of tickets and general handling of the work at a position at the toll board has an important bearing on the speed of service. If tickets are not arranged in systematic and orderly manner, it interferes with the ease with which traffic is handled, delays the location of tickets on which reports are received or additional work is to be done, and prevents the proper following up of delayed calls.

Do you arrange your tickets in a systematic order on the keyshelf? If so, do you insist that they be kept that way? Or

when your rush periods come, do the operators neglect placing the tickets in their order?

There should be a place for tickets on the keyshelf, and every ticket should be in its place. In our office we find that best results for speed and completion come from insisting that orders are carried out as to arrangements of tickets on the keyshelf.

Our toll board consists of ten positions, but all are not always in use; the same work and the same signals can be handled at any position on the board. To get better results, we have arranged the work so that operators working on different positions are responsible for a certain class of calls. The arrangement for each position follows:

Position No. 1: All "in" and "through" connections are handled by this operator. She also records *NC, BY, DA* call orders and *WH* reports.

Position No. 2: All "leave word" calls and all outgoing calls, where call orders have been left, are handled on this position. She also assists the operator on position No. 1.

Position No. 4: All calls not handled C. L. R. are sent to this operator—"in" collects to tributaries, ticket locate, and *BY* and *DA* call orders. That sounds like a great deal of work done on this position, but very few "in" collects and call orders are received in a day's work.

Positions Nos. 6 and 7: All C. L. R. service is handled by these operators.

This arrangement does not mean that the operators on the special position cannot handle or answer any other class of calls. Just as soon as an operator has caught up with her work, she asks those handling delayed calls if she may assist. The supervisors are on the lookout for this and see that the tickets keep moving.

As soon as a ticket becomes a "leave word" call, it is sent to Position No. 2. The operator there examines it for errors and then places its face down in a special pack by her call circuit keys in the order of subsequent attempt time.

Next to "leave word" tickets, in another separate pack we have our "hold for AG's"; two classes of calls that may mean loss of revenue and, therefore, need to be examined by the supervisors as well as operators working on them, as the supervisor may suggest some way of renewing efforts for completing the call.

At present, an operator works only one hour at a time on the "leave word" position. By making this change we find more individual interest is taken each time a different girl handles it.

If the C. L. R. operator cannot work out on a circuit on account of no circuit, she immediately sends the ticket to the operator on position No. 4, who places the call in a pack, face up, in the order of her filing time. Next to this pack, we have the call orders.

Positions Nos. 3 and 5: The work done at these positions is to assist the operator on either side.

If, upon answering a signal, a tributary operator or a subscriber may ask to have his call tried again, the operator knows which position has the "leave word" calls and sends the report ticket to her.

If an operator cannot find a call, she never calls out to another operator: "Who is calling Mr. Jones?" or "Who wants Chicago?" She asks the position handling that certain class of call, and then, if not found, refers it to her supervisor.

"We Should Always Work Diligently," Says Miss Peterson, "In Order That Each Day's Problems May Serve as Stepping Stones to Better Toll Service."

We find that all classes of calls move faster if the tickets are kept on the keyshelf. We can handle more toll traffic with as much speed and as good a per cent of completion, by having a systematic arrangement of our tickets on each position. We keep all tickets not completed on the keyshelf. At one time we had a small compartment which was marked "awaiting completion," but this has now been done away with.

From time to time we change the kind of work done at each position, if it is shown that not enough speed is being used in passing calls, that the completion is falling off, or that the answering of signals is delayed.

We can compare the supervision of our toll work with that of a retail dry-goods store. The manager finds that his sales are falling off, certain lines of goods are not selling, and customers go out without purchasing. He investigates and learns that it may be in the arrangement of his goods. They may not be properly displayed, so he decides to make a change.

He re-arranges his store, using a better system. He assigns clerks to certain counters where formerly they sold goods from any counter in the store. He instructs them concerning the selling of certain goods. In a short time he finds that his sales are increasing; even the clerks become more efficient in their work on account of the changes.

Just so, is it true of our work at the toll board. If our completion is falling off, speed of answer and passing of calls are slow, we should rearrange and systematize the work under our supervision and then we, too, will find improvement in the handling of the calls.

The supervisors should be on the alert to assist operators, thereby relieving them of any extra work so that they may give their full attention to the actual handling of calls. The supervisor can look up telephone numbers, routings and rates, if these are not posted at the operator's position. In this way an operator handling a call may obtain more speed as well as take more time in completing a call.

By taking more time, I mean not to rush through with it on "person-to-person" service after the called number has been reached. Operators have a tendency to work faster since the C. L. R. service started; and if the called party is not at the place wanted, do not ask the necessary questions in trying to locate the party.

Out-going service is not the only service that needs careful supervision; in-coming service is just as important. The distant toll center depends on the operator at the called office to assist her in completing her call, and it is true that an inward operator can cause a great many cancelled calls on first attempts through her carelessness. If the called number does not answer on the first ring, this inward operator should remember that the calling party may be waiting on the line. Proper supervision is lacking if the operator is too busy or neglectful.

Each day brings new problems to be solved. We should always work diligently in order that these problems may serve as stepping stones to better toll service.

Illinois' "Progressive Convention" Set for November 8 and 9.

The "Progressive Convention" of the Illinois Telephone Association has been set by the committee on location and time for Thursday and Friday, November 8 and 9, at the Hotel Abraham Lincoln, Springfield.

This convention is to be conducted along novel lines even for Illinois. A distinct effort is being made by the Illinois Telephone Association to eliminate from the program this year all "dead wood," and to furnish two solid days of educational opportunity and social enjoyment.

Reservations for hotel accommodations should be made at once, as the Hotel Abraham Lincoln has informed the association office that a number have already been received.

Balancing-Out Power Induction

Problem of Balancing-Out "Power Noise" an Important One for Telephone Companies—Theory of Inductive Coupling—Transposition—Normal Effects of Induction—Two Kinds of Induction—Problems for Smaller Companies

By B. C. Burden,

Lincoln Telephone & Telegraph Co., Lincoln, Nebr.

The ever-increasing spread of high voltage power networks in all parts of this country has made the problem of balancing-out "power noise" a severe one.

The solution of the problem and the remedies that must be applied to balance-out induction are mutual in all their aspects, including the contributing causes, the remedial measures and the responsibilities of the telephone and the power companies for its prevention and reduction. However, the burden of interest in the induction problem is one for the telephone and not the power companies. The power companies will in most cases, however, be found ready and willing to coordinate their lines with those of the communication companies, so that a minimum of interference will result.

That the problem is becoming increasingly important can be appreciated when it is realized that while the telephone has virtually reached the saturation points in the rural districts, yet the power companies are just commencing to invade this field. The meaning of this is evident when we consider that the great part of this country is rural. The communication companies must expect that some day they will have to share highways with power companies.

In most states the construction of high voltage transmission lines is regulated by law. This regulation usually takes the form of specifying that communication and power companies "agree" on the coordinating features and details of paralleling construction so that a minimum of induction results or, failing to get together, that hearings must be held before "regulatory bodies" having vested powers to pass on such cases.

It does not necessarily follow that induction will be at a minimum as a result of this cooperative effort recommended by legislation. The resultant immunity will depend mainly upon the knowledge and judgment of the communication company in prescribing the correct coordinating scheme. This point is well illustrated by the fact that merely transposing a power line at set distances without careful regard for the phase relations between it and the telephone lines will in most cases result in as great or greater interference than if left entirely untransposed.

Most of the large telephone operating and holding companies have men who look after their inductive problems and give careful attention to obtaining as near perfect a balance between lines as possible. There are, however, hundreds of small and medium-sized telephone exchanges that seldom are called on to take care of power induction; and they are, therefore, not equipped to design the correct coordinating scheme that will give a fair degree of immunity from power induction.

It was with these facts in mind that this article was written; so that those who only occasionally have need for information of this nature might use it as a preliminary guide. The proper time to coordinate is before the power line is built.

The elementary theory of inductive coupling between power and telephone circuits is a comparatively simple one. Fig. 1 shows how power circuits tend to create noise on telephone circuits because of electrostatic and electromagnetic coupling. The voltage associated with any electric circuit is accompanied by an electric field of force or condition of stress in the surrounding space, whose intensity is proportional to the voltage. At the same time the corresponding current is accompanied by a magnetic field of force whose intensity is proportional to the current.

Inasmuch as these conditions of electrical stress occupy the space surrounding the power conductors, if the power conductors are carrying alternating current whose field is varying with the frequency, then adjacent conductors will have current induced in them, by being cut by these varying electric and magnetic fields.

The frequency ordinarily employed on power circuits is 60 cycles. This is the fundamental frequency of both current and voltage and represents the useful power-carrying component. There is also present in the power circuit, current and voltage of higher harmonic frequencies components, but of much smaller magnitude.

It is these higher harmonics that cause practically all of the inductive noises that we hear on telephone circuits. That this is a fortunate fact can be seen when it is realized that the power of the higher harmonics is only a fraction of that of the fundamental. The reason that the fundamental does not create perceptible interference is because it is out of the easily audible range of the human ear. Were this not true, then the problem of inductive interference would be much more serious.

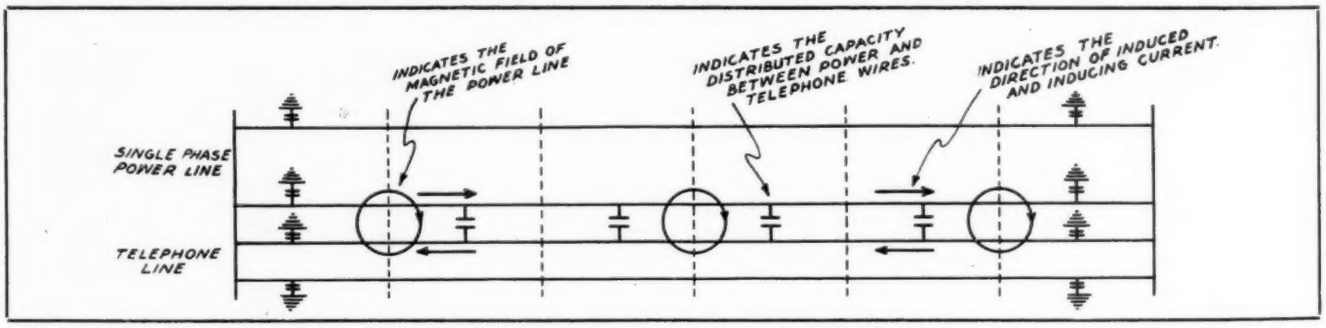

INDICATES THE MAGNETIC FIELD OF THE POWER LINE
INDICATES THE DISTRIBUTED CAPACITY BETWEEN POWER AND TELEPHONE WIRES.
INDICATES THE DIRECTION OF INDUCED AND INDUCING CURRENT.
SINGLE PHASE POWER LINE
TELEPHONE LINE

Fig. 1. Elementary Theory of Inductive Effects.

These are the normal effects of induction. There are also effects known as abnormal, which are created by the sudden opening of one side of a power line, arcing grounds or short circuits, etc.

A study of inductive interference deals with conditions in the power circuit that tends to aggravate induction and schemes for reducing the normal effect to a negligible amount by transpositions in both the power and telephone circuits.

The current and voltage in a power circuit have two components, which are known as balanced and residual. They are defined as:

Balanced current and voltages are those in the several conductors of a power line whose algebraic sum is zero. An example of this would be a single-phase line that is balanced to earth (both conductors having the same capacity to ground) in which case

the current flowing out on one wire would exactly equal that flowing back on the other wire. In this instance, the residual voltage and current would be zero, and the balanced voltage would be the line voltage and line current, Fig. 2.

Residual currents and voltages are those components of the impressed voltage and currents whose algebraic sum is more than zero. An example of this would be a grounded trolley line. The residual current would be the measured line current and the residual voltage the full line voltage to ground. A residual can best be thought of as that component that flows out over the power conductors as a group and back through the ground, Fig. 3.

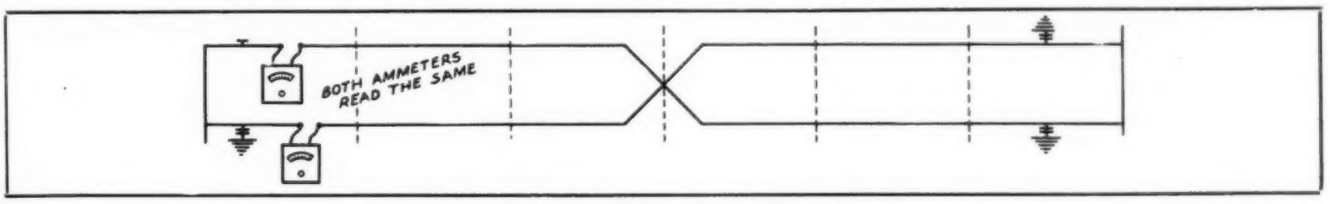


Fig. 2. Balanced Single-Phase Power Line.

Residual currents and voltages serve no useful purpose in power lines, and are the result of differences between ideal design and actual constructional features. They create much stronger inductive effects for a given amount of power than do balanced components. There are several reasons for this. The fact that the inductive loop is much larger, considering the wires as one conductor and the earth as the other, has much to do with this; also residuals contain a larger percentage of harmonics than do the balanced components.

Inasmuch as balanced voltages and currents represent the normal condition of a power line necessary to transmit power, there is no way to reduce the induction magnitude of the balanced components in order to reduce the induction. Residual currents and voltages represent components that are not necessary to the transmission of power; hence anything that we can do to reduce them is desirable.

The main factors tending to create residual currents and voltages in power lines are, in the order of their importance:

1. Unbalanced capacity of power circuits to earth.
2. Leakage to earth caused by defective insulators.
3. Inherent characteristics of some power apparatus to produce residuals.
4. Unbalanced load taps.

The remedies for reducing the magnitude of these residuals are in No. 1, by transposing the power conductors so that each conductor occupies all the different possible pin positions for equal lengths. The remedy for Nos. 2 and 3 is obvious and for No. 4 consists in spreading the various single-phase loads equally over the three phases (case of three-phase line). There are several other factors of lesser importance that tend to create residuals but which will not be taken up at this time.

As every one knows, a transposition is merely the interchanging of the positions occupied by the different conductors on a pole. A very simple process in itself yet without which long distan e transmission would be an impossibility where more than one circuit was involved, or if exposed to power induction.

A transposition does several things. It balances the different wires to surrounding objects, such as other wires, the steel towers supporting the conductors, and to the ground. It also changes the phase of the accompanying field with respect to any point which remains stationary as the conductors are transposed or moved to a new position. When considering telephone circuits and single-phase power lines, this phase change is 180 degrees or a diametrically opposing effect; but when considering three-phase power circuits, the phase change due to a single transposition is only 120 degrees.

Thus when a power line is transposed, the phase of the resultant electromagnetic and electrostatic fields, due to balanced voltages and currents, is changed and the noise induced in nearby telephone circuits is reduced, due to the production of neutralizing inductive effects in neighboring lengths of the telephone circuit. By locating the power circuit transpositions so that each conductor occupies all of the several conductor positions for an equal distance along the parallel, a "power barrel" is established in which the induction to parallel telephone circuits is completely neutralized, theoretically.

A power transposition accomplishes another very important thing, namely, the balancing of each conductor capacity to earth.

A capacity balance to earth is very necessary in order to reduce the tendency for induction from telephone circuits on the same lead.

2. They expose each side of the telephone circuit to paralleling power lines so that voltages of the same instantaneous polarity are built up on each side of the telephone circuit and thus the tendency for current to flow in the telephone circuit as a result of induction is reduced. This effect is known as a transverse balance, Fig. 4.

3. It balances the capacity of the wires to ground and to each other. It might seem that wires in a horizontal plane with respect to earth would have the same capacity to earth. This would be true were it not for the effect of adjacent circuits. For example, a circuit on pins 1-2 has a lower capacity to ground than would a circuit on pins 3-4.

It is not generally appreciated that there are two different kinds of induction, or rather manifestations of induction existing between paralleling power and telephone circuits. These two effects are known as "longitudinal" and "transverse" induction. Longitudinal induction is the induced voltage from conductors to ground, or along the conductors (magnetic).

Transverse induction is the difference of induced voltage from conductors to ground (electric) or difference of induced voltage along the two conductors (magnetic).

The difference between these two types of induction can readily be seen if one considers what happens when transpositions are placed in a telephone line which parallels a non-transposed power line. The voltage induced on the telephone circuit as a whole is not reduced by the telephone transpositions but only equalized. That is, if each telephone conductor is equally exposed to the power circuit, then a voltage

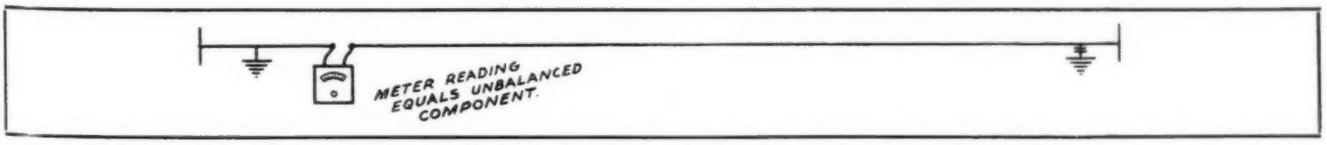


Fig. 3. Completely Unbalanced Grounded Power Line.

of the same instantaneous phase and magnitude will be induced upon it. This is pictorially represented in Fig. 4.

If the telephone line is perfectly balanced, if each of its conductors has the same "series impedance along its length, and to ground—then no current will circulate even though a high voltage may be present on each conductor due to the induction from the power line. In the case shown in Fig. 4, the telephone line could be said to be balanced to the power line transversely but completely unbalanced longitudinally; and the tendency for current to circulate in the telephone circuit would depend upon the degree of balance existing between the series impedance of each conductor.

Now consider Fig. 5. In this figure both transverse and longitudinal induction is balanced. The tendency for current to circulate on the telephone line due to the induction from the power line would, therefore, be nil. This would be approximately true even though the telephone line conductors might have unequal series impedances. It will be noted that the telephone transpositions are placed more frequently than power transpositions. The principal reason for this is that each telephone circuit must balance not only to the power line but also to its neighboring telephone circuits and due to the number of circuits that may be placed on any pole lead, a large number of transpositions is necessary to obtain a balance between all circuits.

Fig. 5 represents the fundamental basis of design that should exist between power and telephone circuits that are well coordinated.

At the risk of repetition I wish to again call attention to the fact that power transpositions reduce both longitudinal and transverse induction, whereas telephone transpositions reduce only the transverse induction.

Power circuit transpositions are not effective in reducing induction from the residual components (except as they tend to reduce the magnitude of the residuals themselves) since these components are in phase in all of the wires of the power circuit and shifting the position of the wires would not change the phase of the induction to parallel circuits. Hence the necessity for so balancing a power line that residuals are reduced to a minimum.

The configuration has much to do with the unbalance of power circuit conductors to ground. It has been found that inequalities in conductor spacing to one another create a much larger capacity unbalance to earth than do differences between the various conductors and earth.

An equilateral triangular configuration represents the best arrangement, while an unsymmetrical horizontal configuration represents the worst. It would seem at first thought that the latter would give the best capacity to ground, as the conductors are all the same distance from ground. However, one wire being located between the other two gives that wire a higher capacity.

Practically all regular toll circuits are transposed according to definite schemes known by various names. The earliest of these was the "A B C" system. After this came the "Standard" system and finally the exposed line or "E" system. The exposed line system is the only one that was designed to coordinate perfectly with power lines. It is designed so that all circuits are transposed at a sufficient number of places in a section to permit of discontinuities in the power line being coordinated with the telephone circuits. Transpositions, load taps, branches, cross-overs, etc., are typical discontinuities in power lines.

Where severe inductive interference is encountered, the larger companies are changing the old type sections to the new E scheme, as this is the only means where a complete balance to all telephone circuits can be obtained.

The smaller companies which have no important toll circuits to look after can very effectively take care of power induction by the use of a few judiciously-placed transpositions in the telephone line, which are correctly located with respect to existing transpositions in the power line, or in the case of a proposed power line, the power company should be requested to transpose so as to form barrels of nine miles or less, and telephone transpositions laid out so that the telephone circuit is balanced between transposition points of the power circuit. If possible a complete power barrel should always be obtained for each normal parallel.

In the case of grounded lines which are to be paralleled by a power line, some immunity may be had from power induction if the power line is transposed quite frequently. It is not unreasonable to expect a power company to transpose a projected single-phase line of 6,600 volts at each half-mile point. Of course, the higher voltage power lines will be much more difficult to transpose so frequently because of constructional difficulties.

Where power lines parallel grounded lines, the magnitude of the residual voltages and currents must be kept at a minimum; otherwise service will be almost unserviceable over the telephone lines.

The two factors which determine the frequency of transpositions in power and telephone circuits are attenuation and phase change.

A transposition at the mid-point of one of two paralleling or adjacent circuits does not, as might first appear, prevent inductive interference between the circuits. This would be true (approximately) were it not for the fact that the current and voltage in being propagated along the conductors are not of the same phase nor magnitude at all points along the line when considered at any instant. This condition, therefore, calls for transpositions located frequently enough that the electrical conditions are approximately the same in these small transposed sections.

The question as to the spacing between successive transposition points in power lines arises frequently. No general rule can be given, inasmuch as the spacing depends upon the existing or proposed transpositions in the telephone circuits. But as stated in a preceding paragraph barrels should be kept at nine miles or less.

Transpositions at the junction of successive barrels should always be omitted. This prevents the "type unbalance" in one barrel adding to that of the next barrel. If these transpositions are placed, the cumulative effect of the unbalance in each barrel, added to that of the next, may amount to considerable.

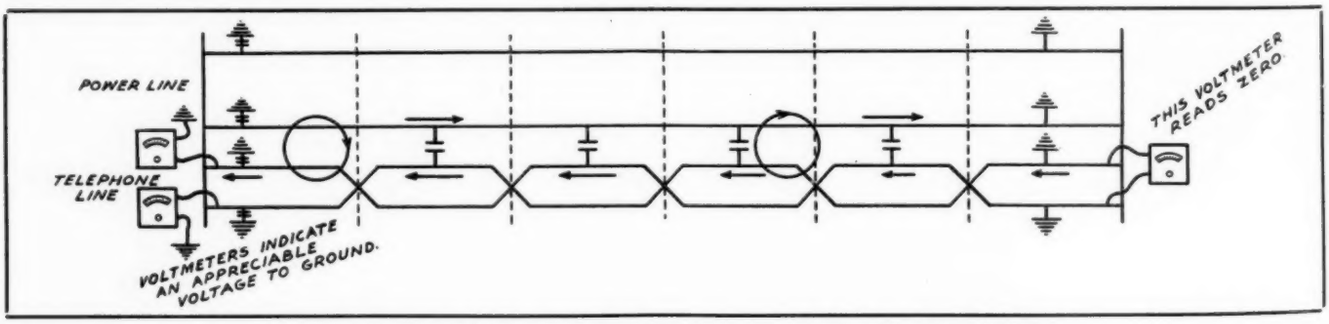


Fig. 4. Power and Telephone Line Balanced Transversely But Not Longitudinally.

There are three common methods of transposing power lines. They are:

1. Continuous barrelling. Each of the wires rotated in a clockwise direction at each transposition point. Represented as *ABC, ABC, ABC, ABC,* etc.

2. Halting barrelling. Each of the

wires rotated in a clockwise direction at each transposition point, except that transpositions are omitted at the junction of successive barrels.

3. Halting reversing barrelling. Each of the wires rotated in a clockwise direction at each transposition point, except that in alternate barrels the transpositions be reversed and the transpositions be omitted at junction points of successive barrels.

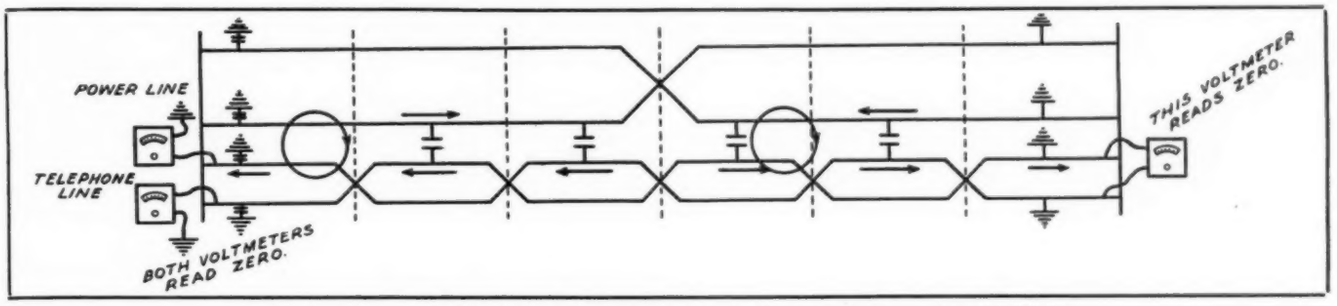


Fig. 5. Power and Telephone Line Balanced Both Transversely and Longitudinally.

As previously stated, continuous barrelling should never be used. If there are two, four or eight barrels then halting reversing barrelling should be used, as the "type unbalance" in successive barrels is 180 degrees out of phase, and if there is an even number of barrels it will cancel out. With three, six and nine barrels, halting barrelling gives the best result, for in this case the "type unbalance" in adjacent barrels is 120 degrees out of phase and with any multiple of three barrels will cancel out.

For the benefit of the smaller companies whose inductive interference problems are few, I wish to point out the following procedure that might be helpful in taking care of inductive problems that come up.

1. Familiarize yourself with state laws governing and regulating parallels.

2. Study the basic principles underlying simple transposition schemes suitable for reducing induction between a small number of telephone circuit and a power line.

3. When approached by a power company that is proposing a power line parallel with your leads, secure from it a map showing route and details of proposed line. Lay out a coordinated transposition scheme of transposition that will provide reasonable immunity from inductive noise.

4. Draw up an agreement with the power company which specifies route, type of construction, voltage, and number of transpositions and their location of the proposed line. This should be properly executed by both companies.

Water Main Break Floods Telephone Duct in New York.

Interference with telephone service between central offices in lower Manhattan and Brooklyn, N. Y., caused by leakage from a water main was eliminated on Friday morning, August 31, according to the New York Telephone Co. The water from the main, escaping at midnight Wednesday, August 29, flooded a sewer which collapsed through the telephone duct. Two cables, containing about 1,100 pairs of telephone wires, were affected.

The rerouting of all calls between the central offices involved was by "tandem trunks" and the interruption to service was slight. A tandem trunk is an existing line which can be used alternately between more than one central office by operation through a "tandem center."

City and Companies Unite in Making Electrolysis Survey.

An electrolysis survey of St. Cloud, Minn., is to be made, it was recently announced. This will include an elaborate checkup of all wires running through the sanitary and storm sewer mains of the city, which carry electric current.

The Northern States Power Co., the Northwestern Bell Telephone Co., and the Western Union Telegraph Co. and Great Northern Railroad will aid in the survey. They are the companies having wires in the sewer mains.

This survey has been needed for the past several years but the joint cooperation of the companies and city has never been secured before.

Work Under Way on New Telephone Building, Newark, Ohio.

Construction has commenced on the new building of the Newark Telephone Co., Newark, Ohio. This building will be one of the most elaborate structures of its type in Newark.

The plans disclose that the building will be 177 feet 10½ inches long, extending from Fourth street to the Elmwood court, and it will be 55 feet 3 inches wide. It will be built of terra cotta and brick and steel supporters and will be two stories high, with provisions for an additional story. There will also be a spacious basement.

On the first floor there will be located the commercial and general offices, a garage, and construction department. On the second floor will be the switchroom, tool room, assembly room, restroom, kitchenette for the benefit of the employes, and in the rear will be the repair shop.

In the basement there will be the battery room, emergency charging outfit, fuel room, and mainly the storage room, for surplus material.

W. L. Cary, president of the company, states that there have been placed orders for 2,600 lines of Strowger automatic equipment, and this equipment will be installed in the new building, together with some of the older material already on hand. Later, it is planned to merge the West and North exchanges in the main office, which will bring the equipment up to 3,100 lines.

Only minor changes are contemplated in the East and Granville offices, and this will make approximately 3,700 lines in the entire system, which will afford service to 10,000 or more patrons. A new eight-position toll board, together with the wire chief's desk, information and chief operator's desks, are also being furnished by the equipment company.

It is expected that the new building will be completed, equipment installed and ready for use by July 1, 1929.

Second Largest City of Mexico Linked with Europe.

Guadalajara, second largest city in Mexico, on September 1 was brought within telephone reach of Europe when it was connected with the Bell system's transatlantic radiophone system. It becomes the eighth Mexican city to be included in the overseas telephone service. The others —Mexico City, Monterrey, Nuevo Laredo, Tampico, Queretaro, Saltillo, San Luis Potosi—were linked with the transatlantic telephone circuit on July 1.

Telephone connection with all Bell system telephones in the United States and Canada was made available to Guadalajara telephone users on July 21. The farthest European city reached by telephone from Guadalajara is Oslo, Norway, about 8,100 miles away.

Voices bound for Europe from Mexico pass northward over long distance lines of the Mexican Telephone & Telegraph Co. to the United States border. From there long distance lines of the Bell system carry them to New York, where the transatlantic radiophone system picks them up and speeds them to England. The rest of the journey to Continental points is made through undersea telephone cable beneath the English Channel, thence via land lines and cables to their destination.

Recreation for Operators and Others

Recreation in Wide Sense Means Renewal of Life—Rest Needed After Day's Work by Grasping at Other and Different Things—Excellent Suggestions Given at Traffic Meeting at Tri-State Convention, Erie, Pa., Held Recently

By Mrs. Mary Post,

General Secretary, Y. W. C. A., Erie, Pa.

My own vacation for this year has just ended and so, if it has been properly spent, I should be in a position to point the way for you to the right sort of recreation. I want to tell you something about my playtime, for your group, each and every one of you, has a very definite part in it.

You were unconscious contributors to the pleasure of my summer for, as I sat beside the placid waters of a little lake in the Pocono Mountains, or drove about in those beautiful hills, I had in mind the subject I had been asked to discuss for you, "Recreation for Operators." Like the psalmist of old, many times I said, "I will lift up mine eyes unto the hills, whence cometh my strength," for I truly wanted to make some real contribution to your thinking about recreation.

In dealing with this subject I am reminded of a story about a very little boy named Johnnie. Johnnie's family, together with friends who also had little children, planned a picnic to a lively lake, and one of the delights of the day was to be fishing. It meant a great thrill for the children, so worms were dug with much ardor with many delighted squeals when nice big, fat ones were unearthed.

Arrived at the spot, Johnnie could hardly wait until Daddy could fix his little pole and put the bait on the hook. Then he promptly rushed out to the end of the pier and—fell in! He was easily pulled out, for the water was not deep. A kindly aunt exclaimed: "Why Johnnie! How did you come to fall in?" To which, in an aggrieved tone, he replied: "I didn't come to fall in, I came to go fishing." Well, if you came to hear all about "gym" classes and such things, I hope you will not go away feeling like Johnnie, for I warn you that I am going to take many liberties with the word "recreation."

To begin with, I take it that in a wider sense, recreation is the same for everyone, in that it means the renewal of life—recreation. It is what everyone of us needs and must have, whether we occupy an operator's position or sell goods in a store, whether we take dictation from some important official or happen to be the one who gives dictation.

When I went away for my rest, a good friend said: "Now see that you play; so many of us don't know how to do that." I have tried to follow that counsel, not only for the joy of the playtime but for the increased joy of coming back to work with a zest that makes every bit of one's duty a pleasure, and transforms the daily task so that we meet it with glad anticipation.

To my mind, all life is continued growth and re-creation is the renewal of all that is best within us—a constant reaching-out and broadening of one's horizon so that we continually attain fair, new vistas. If you know and love the mountains, you will remember how, as one tops a long hill, far, new ranges are spread out before us, of whose existence the secluded spot in the valley gave no hint. Misty they look in the distance, luring one on to try the next height so as to explore the unknow beauties that stretch on and on—ever farther, ever more lovely.

Just so it is with life. We need rest after the day's work; but to rest from a task that perhaps holds more or less monotony, one needs to grasp at other and different things in life.

Do you need physical exercise? Surely you do, and there is nothing better than tennis in the open air, if you can get it; a good class in the gymnasium with quick, sharp direction that keeps your mind on tip-toe as well as your body; or perhaps, best of all, an hour in the pool or a dip in the lake, which leaves you feeling like a million dollars.

If you can't already swim—learn now, this coming winter in your Y. W. C. A., where safety and health are safeguarded, and learn before you are any older. If you don't, you may be able to float; but never, never, never learn how to get up again, once you are on your back. From sad experience, let me tell you, confidentially, that that is no joke!

Perhaps you are not inclined to care for sports, but still I say try to find some activity that holds your interest. The list is long—bowling, basketball, riding, tennis, swimming, and by no means last, a good hike with wide-open eyes. Choose what it shall be, and spend some time in it for the good of your muscles and the more rapid coursing of the blood in your veins. Health demands it of every normal person and Nature will not lightly pass over continued disregard of her rules. Better to play than to suffer the consequences of inaction.

Then, have you a hobby? If not, get one! The thing that you love will, by its very fascination, clear the mind of the day's trials and worries more quickly than anything else. You know it is said of people who have reached a high mark in life, that their success is partly due to the fact that when they turned from the office, they were able to forget it entirely, even though great issues hung in the balance; and they were able to shut out all thought of their problems until the next day. Naturally, such ability means that one can go at the task fresh and strong in the morning, with a clear grasp of the problem.

Strive to achieve this attitude toward your work. So get a hobby and ride it hard after office hours. If you love music and play any instrument, keep it up until you are old and tottering! Music we have ever with us—of all brands now that the radio possesses the land or rather the air—but what you produce yourself, no matter how inferior, has the creative urge and is a form of self-expression you should not deny.

Then there is reading. I heard it said recently that never in the history of the world have there been so many good books written. Alas, it is also true that there is a dreadful lot of trash. Choose carefully, for we are such creatures of habit that once a poor taste is formed it is hard to correct it. A good book takes us into the world of make-believe which may be wonderfully real if the artist is clever.

To belong to the Book of the Month Club is not at all a bad idea, if one is very busy and has little time to spend in libraries. By combining with friends, the cost is small and at the end of the year each one has a few choice books—fiction,

Health Rules for Daily Living.

Eat, drink, smoke, dine, play: in fact, live in moderation.

Take some form of exercise daily.

Stretch, stretch, stretch — morning, afternoon, evening and night.

Drink plenty of water.

Practice deep breathing by means of exercise that produces deep breathing unconsciously.

Be examined every six months by your physician and your dentist.

Determine that you are well, and that you will keep well.

If you are 50, do not allow yourself to gain in weight—diet.

When in normal health you are boss of your will; the will bosses the mind and the mind bosses the body.—Excerpts from the Memorandum Book of Theodore Gary.

biography or whatever you may choose—books that have had placed upon them the stamp of being of the best by a committee composed of our best writers and critics.

One does not read in order to be able to converse about books, but it helps to give poise and ease when with others to be familiar with current books.

As I look into your faces I could well envy you your youth, with its future possibilities in this most interesting of worlds. I can look back on a life that has been rich in many ways. I have known many lands and known many human problems intimately. I would not have it changed. The women of my generation fought for woman suffrage and won it. A great achievement! But I covet the years ahead which you may see and which I may not share, and the part you may play in the world of tomorrow which promises to be the most interesting phase which this old earth has yet seen.

Having advised you to have a hobby, I am now going to advise you to have a cause. If I dared make to you my own suggestion, I would say, solemnly and reverently, "Into your hands we give the cause of World Peace." Two thousand years of Christian living, and we are only now standing on the threshold of understanding. Nations are beginning to think that perhaps peace may be substituted for war; and you who will take the pains to follow what is happening may yet be able to help to crystalize public opinion in the right mold. There are great issues at stake; mighty powers are silently working against peaceful settlement of disputes.

Great changes in human relations do not come easily. They come only when those who see clearly and think straight, put their strength on the side of right. We may well feel proud of Secretary Kellogg's peace proposals, and it is the sacred privilege of us all to back him to the last degree. The greatest battles of all are bloodless; the greatest victories are won in the field of the mind and spirit. I know of no better recreation than a devotion to a great cause, for the individual is lost in the absorption of the struggle. So get a cause as well as a hobby.

Then there are little homey recreations. What girl does not love to experiment in her own room, or her own home, with new arrangement of furniture, new color schemes, the hanging of a long-coveted picture. Courses in interior decorating may be had in many cities, sometimes in the Y. W. C. A. as we have had in Erie, at nominal rates, but they open the eyes to wonderful possibilities. We try our new-found knowledge and get results that make home-coming in the evening a never-ending delight.

Then there is endless happiness for one whose eyes are open to the myriad beauties that lie all about us in this dear, lovely world. It is not given to all of us to travel extensively. Some of us may never sit in reverent silence before the Sistine Madonna, where she gazes out with eyes filled with the brooding mystery of mother-love while she clasps her precious little son. One worships in that quiet room the creation of a great artist, but we can know a delight as keen in our own home town, or in the hills and fields around us, if we have eyes to see.

Joyce Kilmer's poem, "Trees," is familiar to us all, but it is so lovely it will bear repetition many times:

I think that I shall never see
A poem as lovely as a tree.
A tree whose hungry mouth is prest
Against the earth's sweet, flowing breast.
A tree that looks at God all day
And lifts her leafy arms to pray.
A tree that may in summer wear
A nest of robins in her hair,
Upon whose bosom snow has lain
Who intimately lives with rain.
Poems are made by fools like me
But only God can make a tree.

And so I would make friends with trees. While you are in Erie, do look at our trees. They are the glory of the city. Even the far-famed elms of New England cannot surpass our magnificent ones. Find a big one some day, and if it is in a quiet spot so much the better. Stand beneath it and look up into the heart of it. It is like looking up into the stately arches of a great cathedral, only better for it is alive. It does intimately live with God.

Then there are the spreading maples and the delicate silver birches ever floating away before the west wind, with branches that look as though they were leaving the parent tree and going off on some airy cruise, so detached do they appear at their great height.

Then there are the hills, so green in June, so fascinating changeable as the clouds cast their shadows on field and woodland.

Blest be the ever-present automobile which brings these lovely things within the reach of almost every city dweller, making it possible to run away into the country and have supper by a little brook and catch a view of a sunset one can dream about in the dull, cold days to come. This is recreation, indeed.

One more thing I think of as re-creative. It is a discovery I made this summer while I was resting. Perhaps I have known it all the time, but it came to me with new force. The days were placid and restful but sometimes they seemed to lack something. There was a certain void that was hard to define, but at last I knew.

In my daily work many people come to me with their problems and in my effort to help them, I find my own strength renewed. To touch other lives intimately is a privilege we all have if we carry about with us an understanding spirit. To have it we must rid ourselves of bigotry, prejudice and all uncharitableness, but the sympathy we give others enriches our own lives in spiritual growth. Each personal contact becomes an adventure in friendship, and as our perception of human qualities grows stronger, we find all life infinitely richer. The thing we give returns to us again, intensified and more beautiful.

And finally to sum up what I have been trying to give you as my idea of recreation for us all, we find that probably the greatest value lies in those things that are God-given and as free as air.

Think of those lines from the Vision of Sir Launfal:

Bubbles we buy with a whole soul's tasking;
'Tis Heaven alone that is given away,
'Tis only God may be had for the asking.
No price is set on the lavish summer,
June may be had by the poorest comer.

What we need is the ear that hears, eyes that see, and a heart that understands and keeps the windows of the soul wide open to receive the wonders that are poured out upon us in unending bounty. From such things are the springs of life fed, and we arise each day to face the future, glad to work, ready for play when the time comes and full of joy that we are alive in this beautiful world with its possibilities of human kindliness and friendship.

September District Meeting of Illinois Association Next Week.

The September district meeting of the Illinois Telephone Association will be held at Farmington on Wednesday, September 12.

The executives' conference will be held in the Moose Hall and will be under the direct charge of George X. Cannon, president of the association. The traffic conference will be held in the Moose Hall and will be conducted by the traffic department of the associatifion, in direct charge of Dorothy H. Van Ert, general traffic supervisor.

At noon those in attendance will meet in the Masonic Hall for a "get-together" luncheon and sing.

An especially large attendance is anticipated at this meeting, as previous district conferences at Farmington have always been unusually well attended. Those within easy driving distance of Farmington should not fail to mark this date on their calendar.

Prices in the Metal Markets.

New York, September 4.—Copper—Firm; electrolytic spot and future, 14¾c. Iron—Steady; No. 2 f. o. b. eastern Pennsylvania, 19.50@20.00c; Buffalo, 16.50@17.00c; Alabama, 16.25c. Tin—Spot, $48.00@48.12; futures, $46.50. Lead—Firm; spot, New York, 6.40c; East St. Louis, 6.25c. Zinc—Firm; East St. Louis spot and futures, 6.25c. Antimony—10.00c; quicksilver, $128.00.

Joint Pole Use With Power Companies

Common General Problems of Telephone and Power Services—Progress in Relations Between Companies Depends Primarily on Mutual Fairness and Confidence—Joint Pole Use—Address at Tri-State Convention at Erie, Pa.

By D. E. Lowell,

Engineer of Foreign Wire Relations, Bell Telephone Co. of Pa., Philadelphia, Pa.

Where do the communication interests stand today in their relations with other wire-using companies and particularly with electric light and power companies?

Speaking for the Bell Telephone Co. of Pa., I am pleased to say that our relations with these neighboring companies have never been on a more cordial basis. The reason for our present status in relations with the other utilities is due, primarily, to a better understanding and appreciation of our common problem—namely, the requirements and responsibilities for public service.

It is fundamental that each utility shall be the judge of its service requirements. It is also fundamental that in exercising this prerogative in situations involving mutual problems, each utility shall do so honestly, without exaggeration, and with full consideration of and confidence in the other service companies using the same highways.

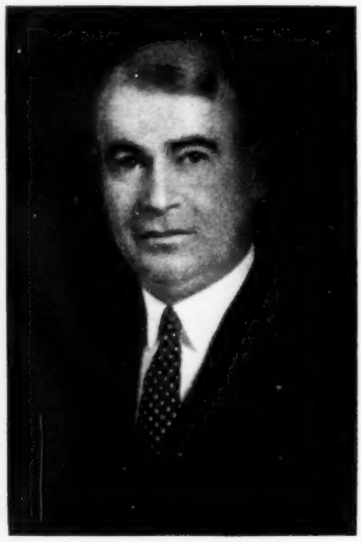
The common use of public highways by the electric light and power, electric railway and communication interests creates many mutual problems, including right of way, safety to life and property, construction and maintenance of plant, and the provision of adequate service, particularly as to the effects of induction on the communication companies.

One of the essential features of telephone service is the degree of accuracy and ease with which the voice is transmitted and received—in other words, intelligibility. Another primary requirement is continuity. Anything that interferes with these basic requirements interferes with good telephone service.

Similarly, power service is based on a continuous, adequate supply of electrical energy, delivered to the consumer at constant potential. Anything that affects constant voltage and continuity of service interferes with good electric light and power service.

These general problems require close cooperation between the utilities for the common good. It is not enough, today, that each service company considers its own service needs alone, because no one service can be rendered without due consideration of the other. The public demands them all, and of a quality that reflects just value for money paid therefor.

Because of the rapidity of growth of these services, allied as they have been with numerous problems of development and uncertainty of the requirements of future needs, the engineers of the various groups were not, generally, able to devote sufficient time to acquire the more intimate working knowledge of the others, problems that would, in many cases, have been of very great assistance in the solution of conditions affecting one or more of the companies. The uncertainty of future requirements has also been a prominent factor in retarding the logical development of plans for mutual economic development.



"Since the Communication Companies," Says Mr. Lowell, "Are the Ones Affected by Induction, It Is But Natural That They Should Take the Initiative in Seeking for Cooperative Action to Get Relief from Conditions Which Would Produce Interference."

Fortunately, the growth of the various service utilities has progressed to a point where future requirements may now be engineered with greater precision; and because of this knowledge the companies are in a position where cooperative action is not only possible but necessary if their services are to be engineered in a safe, economical and efficient manner. The day of isolation is past. The day of friendship and consideration is here. Welcome it, improve it, for it means much to each and every public service company.

Continued progress in our relations with other companies depends primarily on mutual fairness and mutual confidence. In arriving at solutions to specific problems, it may sometimes be necessary to compromise, but if such compromise be determined in fairness and full consideration of all the facts, the spirit of cooperation is fulfilled.

It is to be recognized that the majority of these coordination problems involve convenience of location and right-of-way matters in the case of both services, the protection of the plant and service of the communication companies, and safety requirements of supply companies in the presence of communication networks.

Since the communication companies are the ones affected by induction, it is but natural that they should take the initiative in seeking for cooperative action to get relief from conditions which would produce interference.

The mere fact that interference is experienced due to the proximity of neighboring power wires does not remove from the telephone company the responsibility for making such changes or betterments in its own plant as would be of value in mitigating the trouble. In fact, the telephone company should carefully scrutinize its plant to insure that it has been constructed and is being maintained and operated in accordance with methods which will not make it unduly susceptive to the inductive influences exerted by power circuits.

In like manner, it is only fair to expect that the supply companies should use reasonable diligence in maintaining their systems in a manner that will reasonably minimize their inductive influence.

These mutual responsibilities are recognized in the "Principles and Practices for Inductive Coordination" of the joint general committee of the National Electric Light Association and Bell telephone system. These principles set forth that each company should locate, construct, operate, and maintain its plant in conformity with "general coordinated methods" which maintain due regard to the prevention of interference with the rendering of either service.

The principles further provide that where, in any particular case, general methods are not sufficient, such additional methods specific to the situation shall be employed as are necessary to prevent interference. It is further provided that specific methods of coordination shall be applied to the one system or the other system, or to both systems, as will most conveniently and economically prevent interference.

The analysis of the inductive trouble often requires technical knowledge of a high order, this knowledge to embrace the theory of both telephone and power system operation and equipment. All companies are not equipped with the trained personnel to handle situations of this kind—in which event there should be no reluctance in asking their associates for assistance, which I am sure would be gladly provided.

Any joint investigation of coordination problems should be in accordance with a definite program. The reasons for any tests by either party should be thoroughly understood by the other. The results of the investigation should always be interchanged by the engineers so that the facts shall be available to all concerned. If we are to work out these problems together, then there can be no other procedure than that governed by absolute sincerity.

All public service companies are primarily concerned with the quality of their services. Speaking for the telephone interests, I am sure we feel just pride in the strides made in the communication field. Universal telephone service includes the Bell system and all companies connected thereto, and if high quality transmission is to be given between any two telephones in the United States, then there can be no appreciable difference in the standards of the Bell system and its connecting companies. The user of the telephone is not interested in whether the telephones and facilities used for his conversation lie within or without the Bell companies. He wants *service* and of a quality that makes him satisfied with its cost.

These requirements for overall telephone efficiency call for close cooperation between the component parts of the telephone system. Should some of the smaller companies, necessarily limited in their technical staff, need assistance in the solution of problems of a nature already described, I am sure such assistance would be most gladly given. This also applies necessarily to small power companies needing similar help.

A high quality service of any kind means greater use thereof with a resultant increase in revenue.

Joint Use of Poles.

The common use of public highways by the wire companies has presented one problem in particular that, for years, has received a great deal of discussion. The problem is that of the joint use of poles.

Joint use of wood poles has been a matter of ever-increasing importance to the wire-using companies. Progress in its application has been attended by various cycles of acceleration and retardation dependent on the existing attitude of the utilities toward the common use of pole property.

Misunderstandings about joint use have arisen in the individual handling of specific problems due, generally, to a lack of appreciation of the other company's problem in respect to service and economic features.

While there has always been a universal recognition of the many advantages accruing from joint use, there have, at times, been differences of opinion between the supply and communication groups, relating to the conditions under which joint use would be acceptable or unacceptable practice to one or both of the parties.

These viewpoints have differed principally because:

1. The communication interests operate a system, the inherent nature of which requires equipment operating on small currents, and hence is susceptive to inductive influence of power circuits. The system is further limited by practical consideration of space factors, in its insulation and protective ranges.

Because of these limiting factors, the communication interests have not considered it advisable to expose their facilities to conditions on joint poles (or other situations of proximity) beyond limits justified by service and safety requirements. This policy has included general abstinence from joint use involving long distance circuits or where power circuits have exceeded a potential of 5,000 volts.

2. The supply interests, in recent years, being uncertain as to the ultimate requirements to be met in their distribution voltages, have been unwilling, in some instances, to commit themselves to a limitation in voltage on joint poles, anticipating an investment in distribution plant that would be subject to additional cost of rearrangement should service requirements make necessary abandonment of joint poles with communication companies because of the limitations created.

While these apparently opposing views have been so active, it is readily appreciated that the application of the principle of joint occupancy of poles could not be so constructively applied.

It is particularly interesting and instructive to know, however, that many power companies, accepting the precautionary attitude of the communication companies, have by careful joint planning greatly extended their joint plant to their mutual advantage. It has been found that jointly-used plant, carefully entered into, seldom needs to be changed. In a few occasions where divorce from joint use has been necessary because of a change in the character of circuits, additional facilities or other causes, such alterations have been successfully consummated without working any undue hardship on either party.

The primary qualification needed for the realization of the great advantages of joint construction is cooperation. If the two utilities were under one control, it is reasonable to suppose that duplicate pole lines would not be considered if one pole line would suffice (conditions of safety and service being observed). The cost of construction, maintenance and annual charges for two lines is almost always greater than for one line, except in rural districts where, due to the use of long spans by power companies and small poles by the communication companies, individual lines may in some cases be constructed as cheaply as a joint line.

It is also apparent that the greatest mutual economies of joint use apply when the line is originally constructed to meet the requirements of both parties and both make use of the property when created, rather than create the facilities for future use. Such advance planning also eliminates waste inherent in displaced property although credit be allowed for depreciated value.

The reason for precautionary measures by the communication companies in the protection of their equipment and service has been mentioned. It is well recognized, however, that there will occasionally arise a situation, due to right of way limitations, or other reasons, where joint use or close proximity between communication and high potential power circuits can not be avoided

Ten Rules for Foremen—and Others.

1. **Be fair. Have no favorites and no scapegoats. A foreman has to act as judge many times every day; therefore, he must be just.**
2. **Make few promises and keep them. A foreman must be very exact in this particular. Sometimes a foreman forgets that his job requires a high standard of truth and honesty.**
3. **Don't waste anger—use it. Anger is valuable and should not be used carelessly. Keep your most forceful language for special occasions.**
4. **Always hear the other side. Never blame a worker until he has been given a chance to give his point of view.**
5. **Don't hold spite—forgive. When you have to scold a worker, go to him later and show him his faults in a friendly way.**
6. **Never show discouragement. Never let yourself be beaten. A foreman must have perseverance and the "never-say-die" spirit.**
7. **Notice good work as well as bad. Let the workers see that you can appreciate as well as condemn.**
8. **Watch for special ability. Take a keen human interest in your workers. Put each where he can do his best.**
9. **Take your full share of the blame. This is the most difficult of all. The foreman who can share both blame and praise with his workers has discovered the secret of managing men.**
10. **Prevent accidents. Educate or eliminate the careless man. The good foreman is known by his men.**

—American Machinist.

without excessive expense. In such situations, joint use is preferable to a direct overbuild, provided one line of poles will suffice for both parties. An overbuild, where joint use could have been substituted, generally indicates a lack of cooperation.

Joint use with high voltage circuits has sometimes been resorted to solely in the interests of economy, but this practice should be condemned. Such joint use is only justified where the only reasonable alternative is a less safe arrangement.

Probably the chief advantages of joint use, under mutually acceptable conditions, come from improved plant conditions with a resultant decrease in maintenance expense, and from favorable public reaction because of the elimination of unnecessary poles on highways.

When a communication and a supply company are in accord for the development of the joint use principle, the most efficient and economical manner of observing such an understanding is by means of a general joint use agreement, including, as it would, construction specifications to be observed on all joint poles. Where the extent of the area to be included is rather limited and the number of poles to be made joint are few, the use of specific agreements with accompanying specifications may be more practical than a general joint agreement.

The observance of any agreement is always in accordance with the spirit back of it. It may be an instrument of great value to the companies or it may prove of no value if the spirit behind it is not cooperative.

The use of another company's pole property should always be covered in a legal manner, and just compensation should be paid therefor. What constitutes an equitable apportionment of the expense of joint occupancy is for the contracting parties to decide.

In some cases it may prove to be mutually fair if the allocation of costs were based on the annual charge of an average joint pole and an attempt made for vested ownership of an equal number of poles by each party so as to apportion equitably the responsibility for construction, inspection and maintenance. In other cases this desired division of ownership may not, however, be effected because of the comparative sizes of the companies and their relative abilities to construct, inspect and maintain the pole plant in accordance with acceptable standards.

The field of joint use under mutually acceptable conditions is broad enough today to command the earnest consideration of all wire companies. The ultimate application of the principle is contingent on the attitude of the utilities and the cooperative spirit demonstrated by the personnel.

Looking at these service company problems in a broad way, it is apparent that the greatest mutual benefit to the companies and to the public accrue when there is a real working arrangement between the utilities, particularly as it applies to advance notice of plans.

The proper time for cooperative planning is before money is expended for construction or reconstruction which, if conditions unfavorable to the other party are created, would be subject to rearrangement, thereby incurring an additional expense to one or both companies.

I strongly urge those of you who have not already read the reports of the joint general committee of the National Electric Light Association and Bell telephone system—on "Physical Relations between Supply and Communication Systems"—to do so. Reports already issued by the committee include:

"Principles and Practices for the Inductive Coordination of Supply and Communicating Systems."

"Principles and Practices for the Joint Use of Wood Poles by Supply and Communication Companies."

"Allocation of Costs between Supply and Communication Companies."

The stage having been set for us by the joint general committee, the increased information on these coordination problems now available to all interested companies, together with a greater spirit shown by the interests to work out these matters for their common good, is an incentive to all to attack their problems in a constructive manner.

Year Book Shows American Progress in Standardization.

Important standardization activities in many American industries during the past 12 months are described in the year book of the American Engineering Standards Committee, recently issued. Forty-nine new standards and 40 new projects are listed for numerous branches of industry and engineering, including mechanical, civil, electrical, mining, wood, textiles and safety. The status of A. E. S. C. projects in the major lines of work is indicated by the following table:

Group.	Number of projects.	Projects approved.
Civil engineering and building trades	34	14
Mechanical	72	27
Electrical	50	17
Automotive	5	4
Transportation	10	9
Naval architecture and marine engineering-shipbuilding	1	..
Ferrous metallurgy	4	3
Non-ferrous metallurgy	10	6
Chemical	8	6
Textile	2	..
Mining	19	7
Wood	5	4
Pulp and paper	2	1
Miscellaneous	53	13
Total	275	111

The discovery or the development of the best processes and practices possible with present-day knowledge, and the extension of these, as standards, to all branches of industry is cited in the Year Book as the object of the standardization movement. The American Engineering Standards Committee has adopted 111 national standards up to the present time and is now working on 164 other standardization projects, according to the Year Book.

Continual contact is maintained by the American Engineering Standards Committee with the 19 national standardizing bodies in foreign countries, the Year Book says, with the constant exchange of standards and specifications. The committee receives daily many requests from abroad for American standards or for information about standards in use here.

New electrical standards for dry cells, of ultimate benefit to users of radio and flashlight batteries, standards for industrial control apparatus, and four sets of specifications for insulated wires and cables are listed. New electrical projects include standards for mercury arc rectifiers, and specifications and standards for electrical devices and materials with relation to fire hazard.

Broad revision of the rules of procedure of the American Engineering Standards Committee to keep pace with increasing demands for national standardization activities has been one of the important accomplishments of the past year, according to the Year Book.

Copies of the Year Book may be obtained on request to the American Engineering Standards Committee, 29 West 39th street, New York.

Telephone Directories Show Growth in New York City.

New York City's growth, measured by the yardstick of telephone development, is as steady and rapid today as at any time in the past. The distribution of 835,000 copies of the summer edition of the Manhattan and Bronx telephone directory disclosed the fact that there were 22,000 more of these books needed than in the last edition issued six months ago.

Another indication of the constant growth and shifting of this most concentrated telephone population in the world, is the 30 per cent of changes in the 625,000 listings in the new directory. Removals to new locations, transfers of lines to new central offices and additions of new telephones account for these numerous revisions in listings of names, addresses and telephone numbers.

As a result of telephone growth and establishment of new centers of service since the last directory was published, two central office designations were discontinued, and three new designations appeared.

A card for recording frequently-used telephone numbers or numbers that may be changed is a feature of the new directory. The information section in the front of the book supplies in detail much information of value to telephone users.

Here and There in Telephone Work

Why Not Canvass for Higher Grades of Service?

By A. A. Halstead,
Local Manager, New York Telephone Co., Cortland, N. Y.

It is a well-known fact that too large a stock of equipment items packed away in a storeroom is a real liability. I believe most companies are careful not to tie up capital in repair parts that may not be used for months. However, I am wondering if these same companies are not overlooking a similar situation as regards idle facilities on "outside" plant.

After an engineering study of a certain locality has been completed, and the equipment necessary to take care of expected growth has been installed, there arrives a certain period that is not always a profitable one. This period is the time required to fill up to normal capacity this new plant. There is a point where a certain group of equipment may be said to be on a paying basis. The sooner we reach this point, the quicker will real profits be realized on the investment.

It, therefore, behooves us to seek ways and means to hasten the arrival of the profit-producing period of the plant. Unless the particular locality is a booming town, the normal demand will not bring our plant to the profitable point as soon as we would like it to. We must try something else. We must apply the same method that big wholesalers use to effect a quick turnover of goods—an intensive sales campaign or canvass.

There is no town or city that has an ideal percentage of the higher grades of telephone service. There can hardly be an "ideal" percentage determined, since the gradual improvement in our scale of living will give rise to a demand for better telephone service—for individual or direct line service. The "ideal" figure will slowly rise, ever seeming to be just out of our reach. But if we leave out of our problem the city where there is a dangerously low margin of idle existing facilities, we may safely say that every other city can use a canvass campaign to advantage.

How do we "canvass"? There are many ways. We might mention sales letters and personal visits to subscribers on party lines, counter salesmanship to new applicants and last, though far from least, a real "telephone call" regrade campaign.

The last method, a campaign by telephone to stimulate a desire on the part of subscribers for a better grade of service, is simple, inexpensive, and can be made a part-time job. One good agent or salesman can handle it.

The first step is to review contract record cards or account lists to determine the subscribers who, though they pay for four-party service, are either alone on the line or are sharing the line with but one other party. After this list is compiled, cable books are checked to determine if certain of these subscribers cannot be grouped on one circuit rather than on two, as at present.

It is, of course, economical to do this, and perfectly proper. The subscribers involved in such groupings are then called and an effort made to sell them a higher grade of service. When the subscriber realizes that he will soon have to share his line with three others, instead of one other party, he is willing to listen to the salesman's story.

Just what makes up the salesman's story depends on local conditions and the salesman's ability. It should be made clear, however, that the re-association under way is necessary to the end of making facilities available for future applicants. A good salesman can regrade from 10 to 50 per cent of the subscribers so canvassed.

Since you are giving to a subscriber the kind of service he is paying for, he can see no reason for complaint. Subscribers who do not supersede to higher service are reassigned to unfilled lines, thereby bringing the line loading on the cheaper grades of service to a favorable level.

It is surprising to note that there is no unfavorable reaction to this type of canvass, and there is a very definite revenue increase, together with a desirable line loading condition. A great many people are glad to have taken a higher grade of service, once they have made the change.

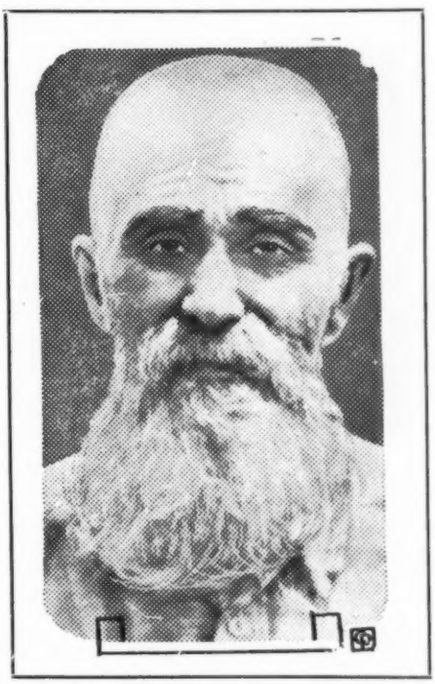
Since others find this method very successful, it may be worth a trial. It will bring you more revenue. Why not canvass?

"Santa Claus" Clark Operates One-Man System in Nebraska.

Probably the most unique telephone system in the world is that operated in northeastern Nebraska by Elias Luther Clark, better known to his patrons as "Santa Claus" Clark, due to his habit of clinging to a long white beard, as well as his generosity and kindly disposition. Mr. Clark's headquarters and exchange are in his house. Mr. Clark lives on a little 40-acre tract in the hay country north and west of the town of Royal. His system consists of 75 miles of aerial wire, and his subscribers number 45. They pay $13 a year for the service, which is continuous.

Mr. Clark started his telephone company 15 years ago. He wanted a connection with the outside world himself, and when he found several of his far-flung neighbors were of like mind, he took the $200 that he had saved from his five years of hard work operating the 40-acre tract upon which he had homesteaded in middle age and which every other settler had passed up. He borrowed $100 from the local bank, and bought 3,000 pounds of light wire from a hardware dealer on time.

Fence posts, trees and regular telephone poles are used for stringing his wires. He



E. L. Clark, of Royal, Nebr., Who Owns and Operates a 75-Mile Telephone System with 45 Subscribers. He Is the Entire Company and Operating Force, and Charges Subscribers $13 Per Year, if They Are Able to Pay.

hires no help, and his office is never closed. He prides himself on giving 365 days' service, 24 hours long, every year. He is his own lineman, trouble-shooter and chief operator. When he is out on the line, his wife or one of the two daughters work the switchboard. He is president and the board of directors.

His repair wagon has no counterpart in the equipment of any other telephone company. It consists of the wheels and running gear of an ancient Ford car, the body of the first International truck that ever appeared in that section, and a top made of galvanized tin and fitted to a wooden frame. The conveyance is drawn by a team of white horses. Usually his wife accompanies him to hold the horses. Although he is in his 70th year Mr. Clark can climb poles with the agility of youth.

When a subscriber has bad luck, a crop failure, an accident, or a death in the family, "Santa Claus" Clark lives up to his title by giving him a year's rent in-

stead of a bouquet of flowers. His leniency is also shown in the fact that he has a rule that service shall be discontinued if two years' rentals remain unpaid. When he is not otherwise engaged, he puts down wells, and also cuts hay and raises corn on his small acreage.

Twelve lines run into his exchange, and patrons are given free connection with the locally-owned exchanges at Walnut, Page, Alders and Dorsey, small towns in that section of the state.

The Commercial Department.

By Maro B. Farwell.

Following is an attempt to outline the usual functions of the plant, traffic and commercial departments:

The telephone company manufactures service and, like all manufacturing concerns, its activities can be divided under two main heads—sales and production. In this discussion, we are concerned with these two—(A) sales (commercial) and (B) production (plant and traffic).

The commercial department has well been described as the "business end of the business." Its functions are many, several of which are listed below:

It is primarily concerned in selling service and it is necessary to know (1) what it has to sell; (2) where it thinks it can sell it; and (3) what price it should charge that will enable the company to serve the greatest number of people and give a proper return on the investment.

Broadly speaking, these are the three major activities of the commercial department.

What it has to sell is telephone service—we all understand that—but there are several different kinds or classes of service. The commercial man should, first of all, be a man with both plant and traffic experience; then he knows *what* he has to sell—just what classes and kinds of service are manufactured, and where and when they probably will be sold in the different parts of each exchange area.

In order to do this intelligently, development studies covering a long term of years are prepared and are known as "fundamental plans." These plans determine the *amount* of plant to be erected, and are based on what we think the market is going to demand.

And the price to be charged—Ah! there is the big question. The preparation of a well-balanced rate structure, one that will produce the necessary revenue and still not too high to make our service unattractive to the masses; rates somewhere between the cost of production and the value of the service to the subscriber.

The collection of the revenue is also a commercial activity and one on which much could be written.

The work of the directory departments includes the contract with the printer, the preparation of the copy, reading of the proof, the sale and collection of the advertising, and the delivery of the completed book.

The general style and character of the directory is very important from a traffic standpoint; therefore the two departments should work close together on all directory matters.

The commercial department is also the mouthpiece of the company, and on it falls the responsibility of courteously and convincingly explaining the reasons behind the various practices and policies of the company—plant and traffic as well as the commercial. It is the *contact* between the company and the customer; it collects the money, and naturally the subscriber looks to it in times of trouble and service difficulties. Therefore, it is necessary that its personnel be employes trained in *tactfulness,* courtesy and patience and also possessed of a sympathetic disposition.

All publicity naturally comes from this department, for it is usually in a position to know what to say, and when to say it.

Business transactions with connecting companies are also matters which engage the attention of this department.

The plant department is primarily concerned with the erection of plant in accordance with the plans furnished by the commercial department, and with the maintenance of it in first class serviceable condition. This includes, of course, buildings.

To state it more clearly, the commercial department's function is to determine the *quantity* of plant, and the plant department decides the *character* of the plant; that is, whether open wire, cable or underground is the proper kind or character of plant that will be the most economical from a standpoint of first cost and maintenance.

In a modern exchange with automatic service, most of the employes are in this department, and on the shoulders of the head of this department falls the training and direction of this entire personnel; quite some job, in an exchange where often one encounters both manual and automatic central office equipment, and the outside plant with its hundreds of different parts ranging in size from the smallest screw to a 20-story building.

And now what of the traffic department? The big job, in a manual office, is the training and supervision of an efficient corps of employes to answer calls and to see that the necessary force is on the job when needed, regardless of the snow, rain, wind and sleet. All this is one of the biggest jobs in our business.

In an automatic office the force of operators is small, but the function of this department is just as important as in a manual office. The task of equalizing the load in such a manner as to get the greatest efficiency out of the central office apparatus is one of great importance.

Proper traffic distribution can save thousands of dollars invested in needless switches.

Nothing has so far been said about "public relations." That is a hard thing to talk about, but "building good will" is an easy thing to talk about because we can think *individually* instead of *collectively.* Really, what we want to do is to have folks think well of us. And this will come about by each department doing the little things well, saying "number, please?" courteously, promptly and quickly, clearing the case of trouble in a satisfactory manner, moving and installing the telephone as though we were interested in the subscriber, and with "thank you" when the bill is paid.

That is the way we secure the good opinion of our public, not by some sort of spectacular display just before a rate case. It is the continuously good performance that counts in this as in all other matters where *confidence* is desired.

RAIN

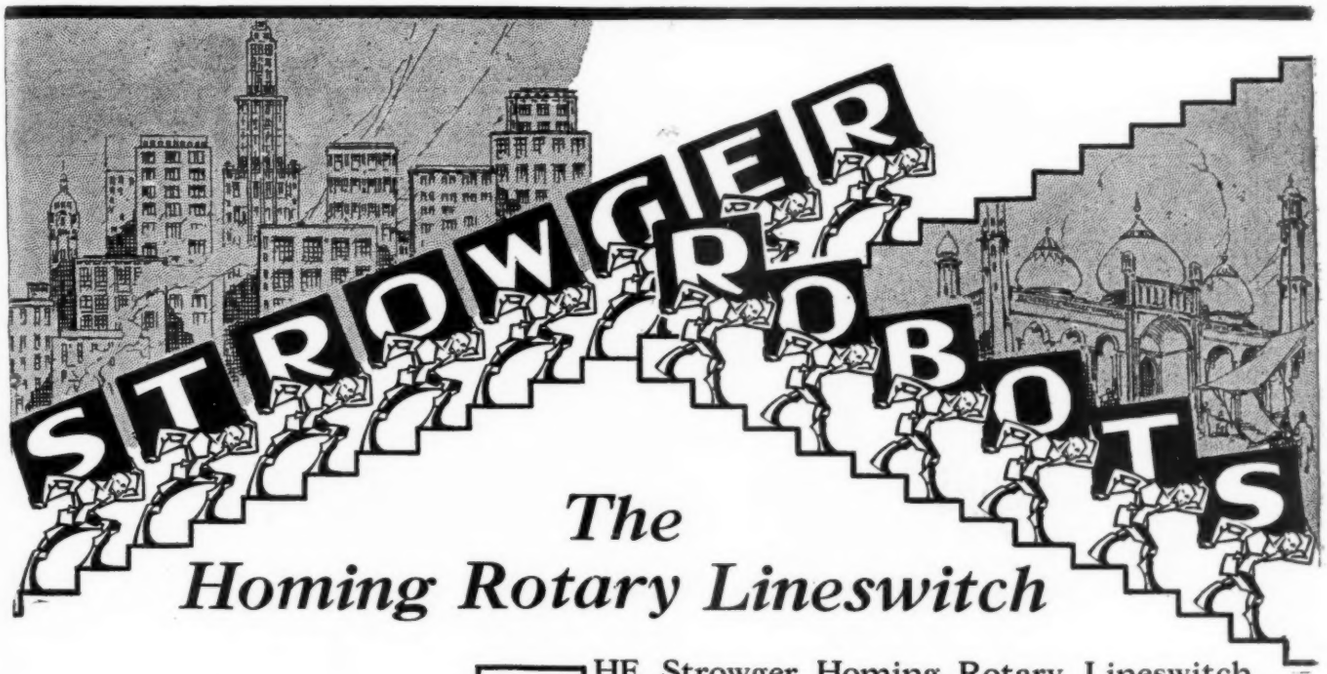
By "Buck"

The rain has been a-peltin' down —it makes the motor tourists frown as they're marooned in some hick town without a picture show. The roads are all an awful mire—there isn't any kind o' tire can do much good 'til it gets drier, the tourist's full of woe.

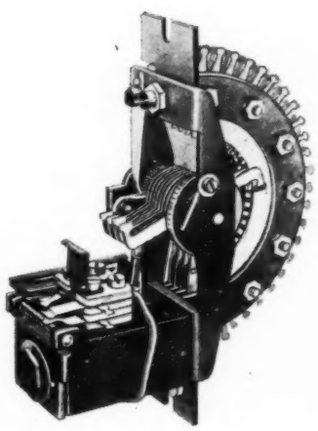
We can't get to our rural line; the foreman walks the floor an' pines because he can't see any signs of the rain lettin' up, by gum!

Most ev'rybody has a grouch—for that I'm sure that I can vouch. The trouble-shooters mope an' slouch, an' all are feelin' bum. They wonder why it has to rain, a-stoppin' work an' raisin' cain, an' givin' ev'ryone a pain with roads all goo an' mud.

They cannot see to save their neck why it should have to rain like heck an' make their tempers all a wreck —but listen here, old Bud: The farmers 'round about have had some luck, but it has all been bad. The drought has knocked 'em flat, me lad; it's shriveled up their grain. An' so to them, this rain's a treat— they'd just as soon have muddy feet, so they can grow the things we eat. Be grateful, Bud, for rain!



The Homing Rotary Lineswitch



THE Strowger Homing Rotary Lineswitch comprises twenty-five sets of contacts arranged in a semi-circular bank, over which contact wipers are rapidly stepped under the control of an electro-magnet and self-interrupter.

Normally the wipers rest on the "home" contacts, and when a call is initiated the switch rotates automatically to seize a free outlet to succeeding ranks of switches, by which it is held for the duration of the call.

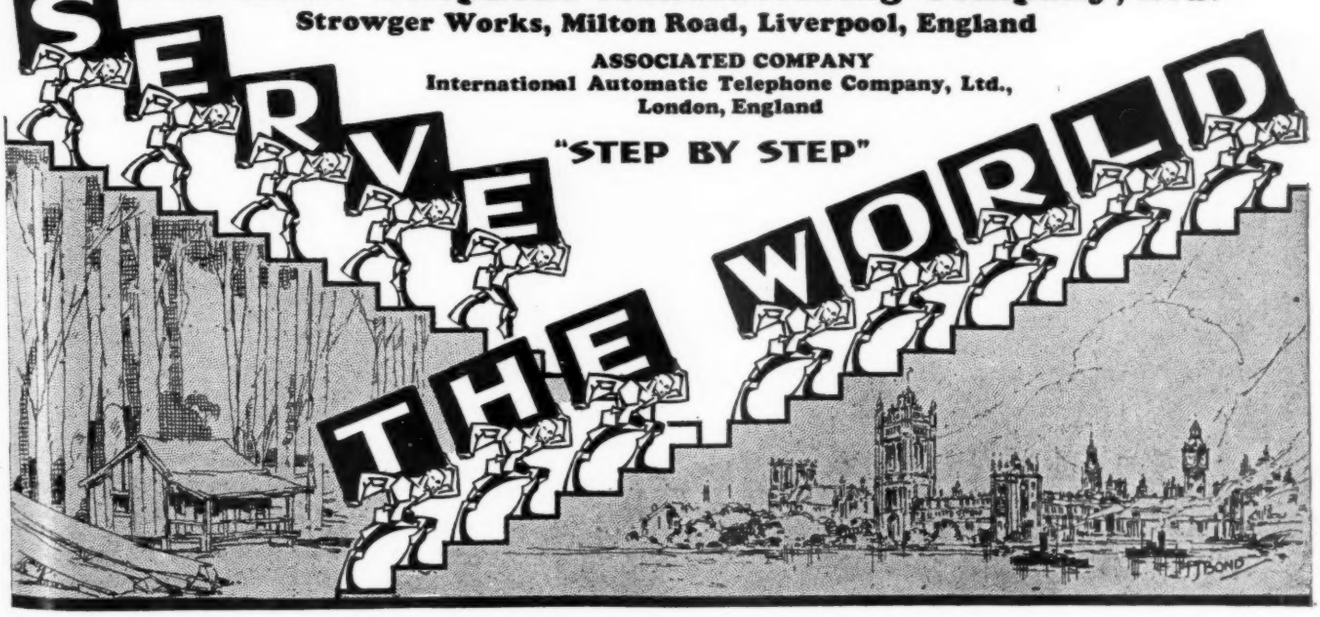
Upon completion, the wipers return automatically to the "home" position, in readiness for succeeding calls.

Homing Rotary Lineswitches are employed in connection with the "graded" principle of trunking, which effects economies in switch quantities.

Automatic Telephone Manufacturing Company, Ltd.
Strowger Works, Milton Road, Liverpool, England

ASSOCIATED COMPANY
International Automatic Telephone Company, Ltd., London, England

"STEP BY STEP"



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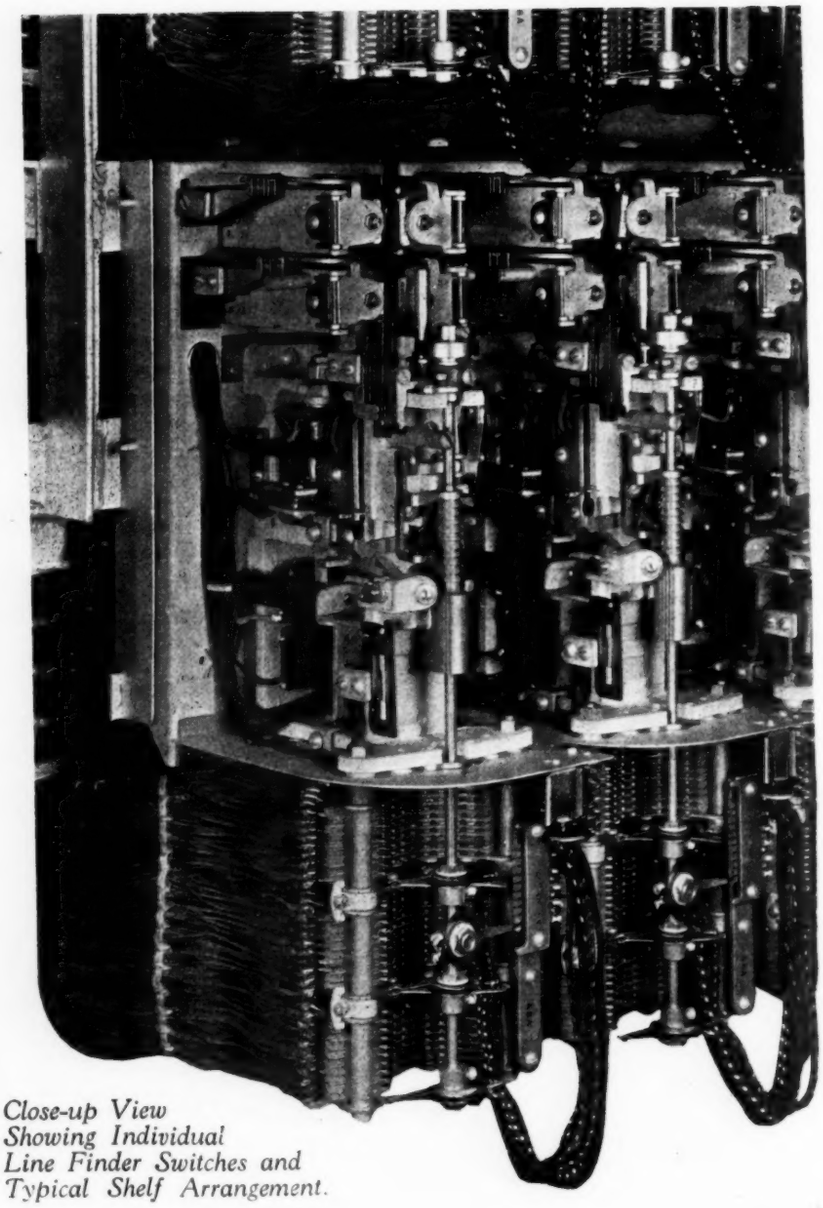

Close-up View Showing Individual Line Finder Switches and Typical Shelf Arrangement.

STROWGER

ting—

Strowger Automatic ine Finder System

er Automatic 200-point Line Finder System, developed by the Research pment Staff of Automatic Electric Inc., stands as a distinct accomplishment gn and application of the line finder principle to the standard Strowger switch e line finder system embodies the same sturdiness and simplicity of con- teristic of all Strowger switches, the economy and durability of which en by more than thirty-five years' actual use in hundreds of Strowger nges throughout the world. For those who prefer the line finder system or ons line finder equipment seems better adapted, the Strowger Line Finder ound to possess outstanding features which place it far in advance of similar evelopments. Some of its advantages are as follows:

1. *ng arrangement provides units of 16, 20 and 24 finders for a group of 200 subscriber lines, t most economical use of floor space for each trunking arrangement.*
2. *arrangement is such as to positively prevent double connections.*
3. *rrangement is such that finders in each group will step an average of only 8½ steps to f the 100 lines in its preferred group.*
4. *d form of distributor circuit is used which provides a different finder on each successive call remely light traffic.*
5. *e is simplified since the mechanical construction and operation of the line finder switch with that of the present Strowger selector and connector switches.*

y other equally important advantages which lack of space prevents listing here. Every 200 o two 100 line groups, the apparatus for either of which group will automatically take care r associated group, in case its finders are all busy or if a fuse should blow. Provision has y conceivable possibility of failure, so that no calls will be lost.
nical details and information regarding the application of the Strowger Automatic Line any particular conditions are available—ask for them.

Automatic Electric Inc.

Factory and General Offices: 1033 W. Van Buren St., Chicago, U. S. A.

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R AUTOMATIC

Value of Educating the Public

Ways of Reaching Public to Inform Them Things They Need to Understand Are Movies and by Printed Page—Various Things They Should Know—Directory Logical Place for Many Explanations—Educating Public in Rate Making

By Mrs. B. M. Cowles

Since the telephone industry has "put the serve in service" and taken the "curt out of courtesy," the work has become more congenial, and the only thing to mar perfect understanding with our telephone-using public is ignorance on the part of the public. The old saying that if a man isn't up on a thing he is usually down on it, is certainly true in telephone work. Adverse criticism comes from persons ignorant of the facts. When conditions and difficulties are known, fault-finding disappears.

Of course, we are long past the stage where Johnnie's mother calls the manager to ask if Johnnie may talk on the telephone, as he has the measles. And everyone knows whom to blame in the story of the woman who called the manager and said that something ought to be done about the operator who answered the telephone in the morning "because when she answered me early this morning her breath was something terrible."

Our telephone magazines are full of articles, which, if read by the general public, would so educate them that much of the criticism and misunderstanding that exists today could cease. But these magazines—like the old-fashioned temperance lecture which was attended by people who had signed the pledge, while those who needed the lecture most were conspicuous by their absence—do not reach those who would most benefit by them. The point is to get before the public eye the things they need to see and understand.

Two modern ways of reaching everyone are: through the printed page and by the movies. The large companies use the newspapers to reach their public when they wish to sell stock, to raise funds for enlarging their plants, for explaining the reasons for the necessity of higher rates, for explaining changes in their operating methods, or when about to make construction changes.

Our popular magazines have recently published many highly educational, as well as interesting articles on the telephone industry. The buying by the public of stocks and bonds of the company serving them has helped toward public enlightenment in the telephone industry. A personal interest in a concern is sure to become an enlightened one. The trend is in the right direction, but we are far from a 100 per cent understanding with our public.

The smaller companies find it less practical to reach their public by the news sheet. It has occurred to me that we smaller companies might make more use of our telephone directories in reaching and teaching our public, than is usually done.

The average small company directory has merely a few brief rules for calling and an explanation of the code, the names of subscribers and their ringing numbers. The balance of the space is filled with "ads" from here, there and everywhere.

COURTESY TRANSFORMS

A meeting with an old-time Chinese scholar elicited the meditative conclusion: "When all is said and done, courtesy remains the most certain proof of the superiority of a civilization.

"It is the great aristocratic hypocrisy which banishes the obscenity of the human beast and transforms the egoisms and atrocious rivalries of men into an aesthetic spectacle. It scatters precious moments through everyday life like those golden points which gleam in the lustrous surface of lacquer."— Abel Bonnard in "In China."

Every telephone patron has a directory. These directories will not be destroyed as is a newspaper. They are kept in a place where they can be turned to at any time. If these directories contained information regarding telephone matters, any time these things were being discussed people could turn directly to a source of information.

Right here, let us do a bit of standardization. Why does each company have its own code for calling when one code, a standard code, would simplify matters for both patrons and operators? More than once when hearing a strange ring on a line, I would investigate to find some newcomer trying to ring by the code in use in the place from which they had come. They had not stopped to read directions in our directory. There are several different codes in use from which one could be selected.

Then, too, there are people—many more than one realizes—who do not understand the code. They seem unable to get the simple matter through their heads and call in for the ring of some one on their own line. When told that the person is on their own line, they say that they know that, but they do not know the ring. This makes extra work for a busy operator. Why not dispense with this by putting after each code number the ring like this: "5R61—line 5, ring 1 long and 1 short." Matters like this seem very small, but like a mosquito can be exceedingly annoying.

After adopting a standard code, and then making it fool-proof, let us proceed to utilize a few pages of the directory in educating our public.

First, inform our patrons in regard to our financial condition. From our commission reports, a statement can be made showing our income from different sources, and our expenditures.

Show an itemized statement of the company's expense. Let them see that the telephone company has to pay interest and taxes, a big tax, too; 4 per cent on every dollar we earn, whether we collect it or not. Be sure to call attention to this fact. Show the size of your repair bill. Itemize some of the largest bills. Perhaps some boy will be conscience stricken when he sees what it costs to replace an insulator that he has shot off a pole.

In connection with the repair account, tell the incident of the woman in the middle of a 17-mile line who took the tinsel trimming off the Christmas tree and laid it temporarily on top of the telephone. Tell how the repairman went out to hunt the trouble on one of the coldest days of the winter, and how much it cost in dollars and cents to find out what was grounding the whole line.

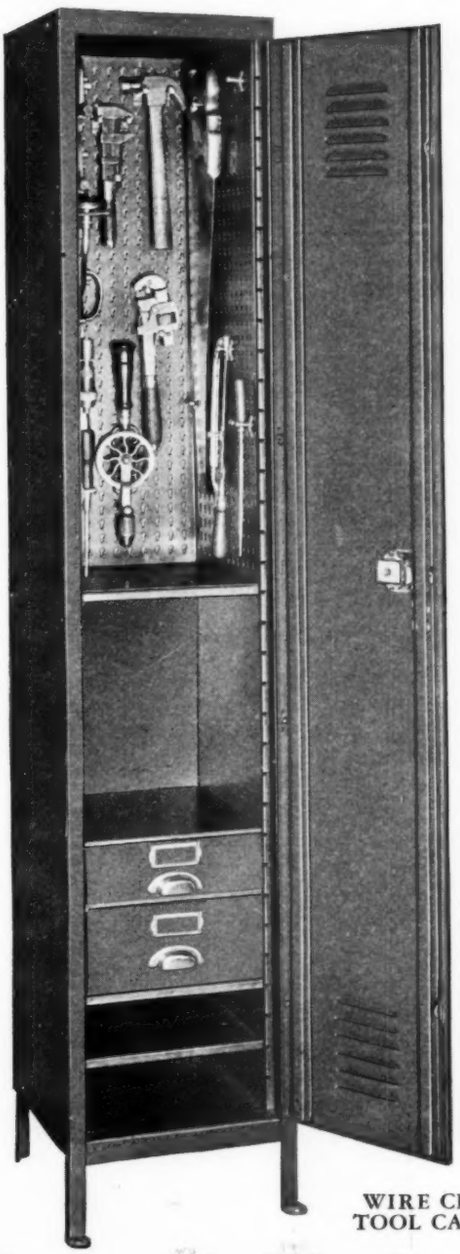
Let them know how much we pay out for batteries in a year; how much for line repair; for station removals, and other changes. Our patrons cannot know too much about our expense account.

Another source of trouble is the toll rates. The public is slow about realizing that there are different classes of calls. This should be carefully explained in the directory.

Mr. A comes in with a grievance. "Here, I put in two calls to C. One is marked $.20; the other $.30." You find that one was to a store and, therefore, a station-to-station call. The other was to Dr. Dot and, therefore, a person-to-person call. You explain that one was to a person and, therefore, took longer than just to ring a number.

After this, Mr. A may decide that he will always put in station-to-station calls.

LYON



WIRE CHIEF'S TOOL CABINET

NOTICE the degree to which specialization in storage equipment has been carried in this Wire Chief's Tool Cabinet. There's a tool panel, three plain openings and two drawers—one with and one without trays.

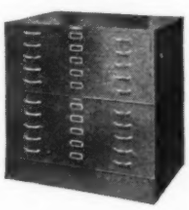
Just as specialized for its purpose is Li-flat, a cabinet that will hold, flat, your maps, blueprints, tracings and other large papers. Made in five sizes, the largest taking papers 50 inches by 38 inches.

For the janitor even, Lyon has developed special storage equipment, where cleaning materials may be kept under lock and key.

But Lyon prestige among telephone men has not been built on specialization of individual items only. There's Lyon quality and the completeness of the line to command admiration.

To know how complete is the line, and how sure the quality, write for Bulletin 314-A, filled with illustrations and detailed information.

LI-FLAT



JANITOR'S CABINET

LYON
METAL PRODUCTS
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Successor to

DURAND STEEL LOCKER CO.
Chicago Heights, Ill.

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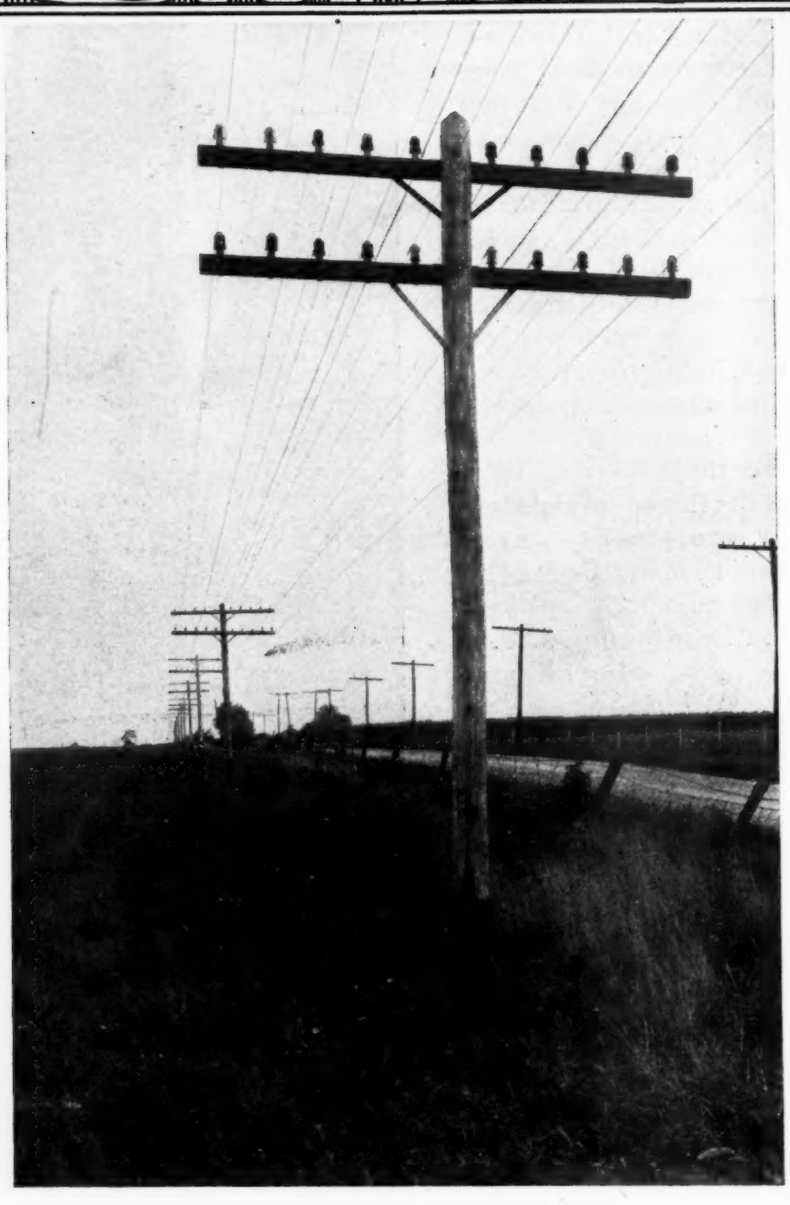
STEEL STORAGE EQUIPMENT

LYON METAL PRODUCTS

Steel Shelving . Lockers . Cabinets . Counters . Steelart Folding Tables and Chairs. General Steel Storage Equipment and Steel Furniture. The Lyon name and trade mark attest the strength, finish, usefulness and durability of Lyon Steel Products

P&H Gaining



"P & H" Butt-Treated Poles in lines of Troy Telephone Co., Troy, Ohio.

When writing to Page and Hill Co., please mention TELEPHONY.

Every Year

"P&H Process" Cedar Poles

"P & H Process" Poles are the final achievement of experience and development in the manufacture of cedar poles dating back to 1903.

The demand has increased steadily year after year until "P & H Process" Poles have become firmly intrenched in their position of leadership in the pole industry.

Such a record must have behind it an individualized product of unquestioned merit. The outstanding results achieved in "P & H Process" Poles include:

—deeper penetration of preservative,
—more uniform penetration,
—more uniform saturation,
—greater amount of free oil.

These results, combined with unusual care in the production of our poles, assure the longest pole life, -- the lowest per annum cost. Every "P & H Process" Pole is *guaranteed* in writing to show a full sapwood penetration to a depth of one-half inch.

***Exceptional Shipping and Tracing Service* have also been a factor in "P & H" success. All cedar pole needs supplied promptly—Northern White Cedar or Western Red Cedar.**

"Still in the Lead"

PAGE AND HILL CO.

MINNEAPOLIS, MINN.

New York, N. Y., 50 Church St. Chicago, Ill., 19 So. La Salle St. Dayton, Ohio, 854 Reibold Bldg.
Kansas City, Mo., 517 Pioneer Trust Bldg. Omaha, Neb., 734 Electric Bldg.

When writing to Page and Hill Co., please mention TELEPHONY.

So later he calls for the doctor's office. When he gets his bill, he is charged 20 cents for the call. He comes in very indignant because he didn't get the doctor the time he called. So there is more explaining that he did get what he called for, and must put in a station-to-station call only when he is sure the party he wants will be there.

Next take the collect ticket calls. Mr. C came in and asked: "How much is a call to Fargo?"

He was told 40 cents, station-to-station; 55 cents, person-to-person. He asked: "If I call the Western Union, is that a station-to-station call?" and is told that it is. "But here you have me charged 55 cents for a call to the Western Union."

The original ticket was brought out, and showed that the Western Union had called him on a collect, and collect calls always take the person-to-person rate.

And Mr. B, whose lady love is visiting in some distant town, calls her 15 times in the course of three weeks. When he gets his bill he is surprised at the amount; and he comes in to find out why, when he called after 8:30 p. m., he didn't get evening rates. He left, a wiser man, knowing that only station-to-station calls take evening and night rates.

Value of Directory Explanations.

The toll rates should be clearly explained in the directory, so that these mistakes may be avoided. The directory is the logical place to place such explanations.

When the fond young mother lets baby say, "Hello, daddy," over the telephone, it sounds very sweet to both of them, of course. But, sometime later when mother isn't in the room, the operator does not enjoy it when the telephone drop keeps ringing in and a baby voice keeps saying, "Hello, daddy." Then, as likely as not, bang goes the receiver, and the repairman has to pay a visit to put on a new one; expensive for the telephone company and of no benefit whatever to the baby, for he ought never to get the notion that the telephone is a plaything.

Just tell in the directory the attitude of the company toward Baby's use of the telephone. Shall we set an age limit? Any operator can tell you that this is more of a nuisance than those not familiar with the situation know.

Then, we have our troubles with the person who is sure he remembers the telephone number. When he gets the wrong party, he is sure to say that Central gave him the wrong number. An incident occurred that shows what serious results may follow when a person trusts his memory.

A young man had been taking first one young lady, then another to our local doings. He could not decide which of the two he liked the better. One day he called for 22R33 and talked, he thought, to 33R22 asking her to go to a dance with him. She accepted his invitation and was ready and waiting for him to come.

But, she waited in vain, for he thought that he had talked to 33R22 and went after her. The young lady at 22R33 has since treated him in a cold, haughty manner—and only the operator might explain the situation.

To avoid such tragic errors, why not put a blank page (the back cover would be best) upon which might be jotted the numbers each patron calls most. The very act of writing them down would serve to fix them more firmly in his memory; and if he were not sure, he could see at a glance without bothering to look up the number.

Troubles with Various Calls.

One rule which seems to cause some dissension is that a toll call is charged to the number from which the call originated. Any trouble from this source can be eliminated by first calling the owner of the telephone and having him O. K. the call before it is put through. If this is done, all disputes from that source are done away with.

Then, there are the pay station calls. When a farmer who has a telephone calls from a pay station, he thinks that it is an imposition to ask him to pay a nickel. Let him be told, in the directory, that the rent he pays is just for the use of his own telephone. Explain this by showing him how much cheaper is the nickel for such a call than it would be to make a trip home and back. Such explanation would save the operator trouble.

Every directory in its list of rules contains one setting a limit to the length of conversation, but every office still has its "line hogs." Sometime soon, I am going to time, as nearly as I can, my worst offender in this respect.

In the next directory will be a paragraph telling that one person on a farm line which has 16 families on it with an aggregate of 96 persons who might want the line at any minute, had in the course of one week used the line 6 hours and 40 minutes. If each person used the line as much as she does, the days would have to be more than three times as long, and some one would be talking all night as well as all day. Or, the line would have to be divided into four parts to accommodate people.

Allowing Neighbors to Use Telephone.

Each long-winded person who reads that will wonder if she was the guilty party and may, perhaps, try to be more considerate of the rights of others.

One rule that should be made more emphatic and enforced more rigorously is that of allowing the neighbors the free use of the telephone. In every community are persons who think that it is unnecessary to have a telephone because their next-door neighbor has one. The persons who have telephones find it hard not to oblige their neighbors. It seems small to mention the nickel that is supposed to be charged.

Include in each new telephone directory a neat little card upon which is printed the rule of charging five cents for every call made by a non-subscriber. Print on the card that the call will be charged upon his monthly statement. Sign this card: "By order of the manager," and his name. Then request the subscriber to put up this card close to the telephone and call the attention of the neighbor to the notice. Of course, this will not entirely eliminate this evil, but would help to some extent.

The public ought to be better educated in the different conditions that govern rate making. Not long ago, one man made a remark that the rates ought to depend on the number of telephones a person could call without paying a toll charge. An intelligent reading of the financial affairs of any telephone company will convince anyone that such a plan would not work very long.

A stock company must, after paying its expenses and allowing fairly for depreciation, have an income sufficient to pay a reasonable rate on the amount invested by the stockholders. We want our public to realize this, for such an understanding becomes a necessity when rates have to be raised. Devote a page in the directory to such an explanation.

The few extra directory pages necessary for the facts suggested and any others that might be of benefit to any particular locality, would cost but little in comparison to the help given toward a better understanding with our public.

Reaching Public Through Movies.

Every little hamlet has its moving picture shows. Here is a chance to reach a large proportion of the public. If pictures were made showing the evils of the telephone sponger, of the line-hog, of the rubber-neck—pictures that show up these people and make them ridiculous—they could be sold to the companies desiring them. They could be displayed as is the local advertising matter.

It seems to me that all of us smaller companies would make use of such material if it were available. Any operator could give ideas in plenty for such pictures taken from actual experience.

What is the reason that insurance companies do not charge a lower rate on buildings containing telephones? Everyone knows that at the knowledge of fire, the first thought for getting assistance is the telephone. Think of the time lost if one is obliged to leave to get help.

In one of two farm fires in this vicinity, every building would have burned but for the immediate response of the neighbors to the call for help. As it was, only the granary burned.

In the other case, the fire was discovered too late to save the house, but all the furniture was saved. This could not have been done, had it not been for the

OLIVER TELEPHONE DISTRIBUTING BRACKETS.....

...used by most Telephone Companies

This is No. 5085

THE largest users of telephone Pole Line Hardware in the country have been using Oliver Telephone Distributing Brackets for more than thirty years. Hundreds of thousands of them are in use in all parts of the United States. Most Telephone Companies find these brackets ideal to use on pole and house work for running twisted pairs when used with two or four groove porcelain knobs. They are uniformly accurate, each one being exactly alike. Coated by the "Fassinger Process" of double dip hot galvanizing insures a greater resistance to rust, thereby prolonging their life. See the table below for complete information, or refer to page 11 of the Oliver Condensed catalogue.

HOT GALVANIZED

Stock No.	Length of Legs	Weight Per 100 Pcs.
†5085	2¼"x3 7/16"	51
†5086	3" x4"	87

†A. T. & T. Co. St'd.

No. 5085 has 9/32 in. holes.
No. 5086 has 13/32 in. holes.

Oliver Iron and Steel Corporation

South Tenth and Muriel Sts., Pittsburgh, Pa.

"OLIVER THE LINE"

When writing to Oliver Iron and Steel Corporation, please mention TELEPHONY.

call which brought the neighbors in less than five minutes. In still another fire where there was no telephone every building burned and very little furniture was saved.

It seems to me that one of the most essential things in the protection against fire has been overlooked. Perhaps the telephone would be more appreciated if a lower insurance rate were charged because of it.

One of the best ways to awaken an appreciation of the telephone is to have the service cut off for a few days. Three years ago, our company had cable trouble that cut off more than half the leads for four days. Not long ago, a farmer, who came in to pay his bill remarked that he could not get along without his telephone, and said that he never was obliged to make so many trips to town as when we had cable trouble.

How instinctively people turn to the telephone to save "time, trouble, and travel." We take it as a matter of course, without a thought of what a vital necessity the telephone is to the business and social interests of today.

We do not expect people to go about shouting the wonders and praises of the telephone. All we want is an intelligent attitude that does not expect the impossible; that makes allowances for the rights of others, which does not impose on the goodness of the world at large. Such an attitude is entirely possible when our public is rightly educated.

Eaton, Ohio, Company Holds "Open House" in New Building.

Patrons and the general public inspected the new home building and equipment of the Eaton Telephone Co., Eaton, North Cherry street, between the hours of 8 a. m. and 9 p. m., Saturday, August 11, when the company kept "open house" as a means of celebrating its recent establishment in its new plant, and to afford patrons and the public an opportunity to inspect one of the city's most important public utilities.

Upon the occasion of the company's "open house," a number of baskets of flowers were sent to the offices by local firms and individuals, accompanied by cards expressing good wishes.

Scores of groups of people came, saw and went during the day and evening. Officers, directors and Manager E. G. Morgan received the people and conducted them through the entire plant, explaining the workings of the system.

August 1 marked "moving day" for the company. On that date, in the evening, took place vacation of the old exchange building and the placing in operation of the new plant, all lines being "cut into" the new building at that time. Upon this occasion a group of local citizens were present to witness inauguration of the new plant's operation. Telephone officials and experts from a considerable radius also were present. Prior to this the company had installed its executive offices in its new home.

The plant represents an expenditure of approximately $60,000 and company officers express belief that it can be rated among the most complete and modern to be found in any little city of the size of Eaton anywhere.

The building is of brick construction and apparently erected with a view to having it as nearly fireproof as is possible. The window casings and frames are of steel. The arrangement of the interior gives one the impression that sight was not lost of that desired essential quantity—convenience—in the operation of a plant of a public utility character.

Telephone service was first established in Eaton in 1897 by J. A. Brooks, who went to Eaton from Attica, Ind., and installed an exchange. About two years later a group of local men formed a company and took over the utility, giving it the name of the Eaton Telephone Co. The company has recently been sold to the Goodrich interests of Indiana.

Where a Crossed Line Brought in a Customer.

The old sayings, "It's an ill wind that blows no good" and "Kill two birds with one stone," are well exemplified in a story going the rounds of the press.

A prospective customer was called on the telephone by a local grocer, and through a crossed connection of the telephone another party came in on the line.

The second party listened to the fine sales talk Mr. Berry gave to party No. 1, with the result that after the receiver was hung up, party No. 2 called Mr. Berry and told him that she "was so impressed by what you said" to party No. 1 that she, too, would open an account with his store. Thus two fine customers were gained through the sales energy expended.

Resigns from Illinois Commission; Chicago Man Appointed.

Daniel McKee Jackson, Chicago, was last week appointed a member of the Illinois Commerce Commission by Governor Len Small. He succeeds Edward H. Wright, also of Chicago, who resigned August 27, effective September 1, because of ill-health.

WORKING-DAY FACES

By Miss Anna Barnes,

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa.

I had a long wait in a shoe store yesterday, but I did not mind it as I had plenty of food for thought, watching a young girl.

She was pretty, and knew it. But her prettiness was all on the surface, for she was spoiled. It would not be long now, I decided, until her prettiness was definitely marred; marred as completely as is the petal of a rose that has been fingered. Prettiness was her full stock in trade. I wondered if she had thought of it as perpetual.

After she had pettishly flung herself from the store because her mother had purchased shoes like hers, the saleslady exclaimed: "Oh, that girl, how I would like to shake her! We have known her for years and she is always like that; humored to death. Nothing to do except hunt for something different in the way of amusement and clothes."

What sort of a contribution is such a person making towards her life as well as others?

After all, busy people are the happiest. When there is not enough work to fill a day for all employes in an office, for instance, they are not as contented as they would be otherwise. I have found this to be true, and so, probably, have you.

There are hundreds of people like th iysoung girl, flooding the streets, stores, and theatres, who have no object in life except to see and be seen. They are easily recognized by the bored, aimless expressions on their faces.

Go into a busy office and observe men and women working. Note the expression on the face of each one of them. What does it tell you?

It seems to tell me this: Each man and woman yonder has an object of his own; a part of a big work which is his own to do. He feels assured that every other employe has his definite work and is doing it. He does not waste his time in questioning the capability of others. On such faces you see character and purpose indelibly written.

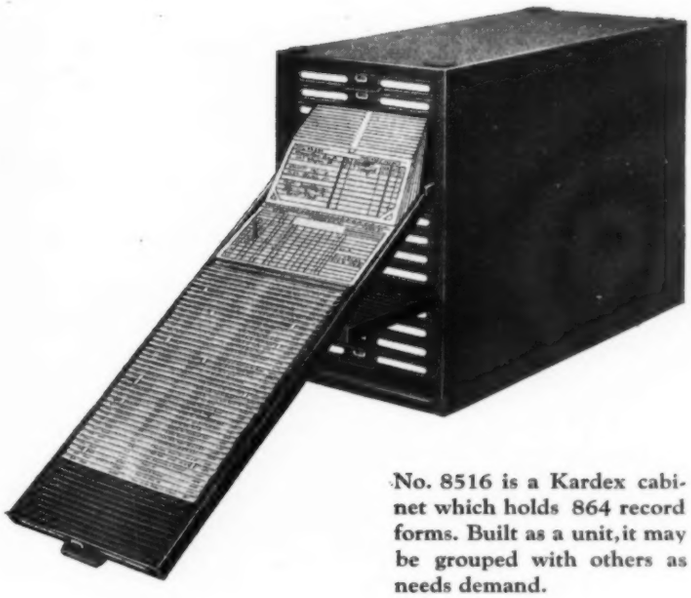
Moral: It is good for humanity that there are so many working-day faces in this world, because the people to whom they belong have come as near to the understanding of God's plan for humanity as it is possible for men and women to come. Their faces are infinitely more satisfying to look at than movie pretty faces.

Better than fast— because of Kardex signalling

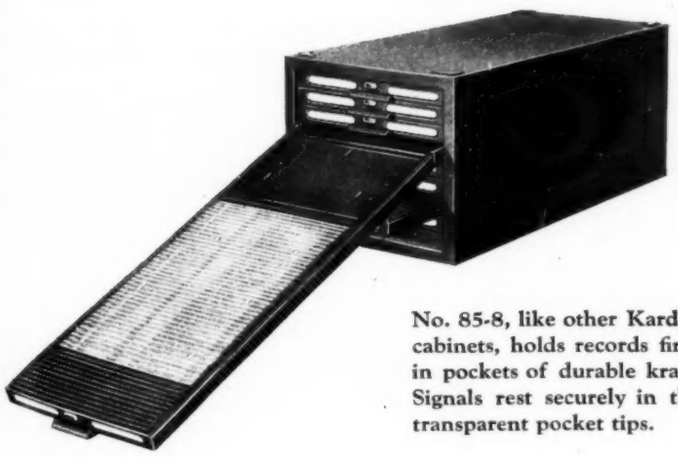
The Kardex record is a speed-record. It's visible. It *must* be fast!

But Kardex is better than that! For Kardex is a record alive. Brightly colored signals tell you the important facts posted in a Kardex slide. You *know the details* instantly.

Right there is the reason that Kardex is proper equipment for the telephone company that would replace guess-work with fact-work. Whatever your record need, there is a size and form of Kardex visible cabinet which offers you the security of a record that presents posted facts graphically. Your letter of inquiry obligates you not at all.



No. 8516 is a Kardex cabinet which holds 864 record forms. Built as a unit, it may be grouped with others as needs demand.



No. 85-8, like other Kardex cabinets, holds records firm in pockets of durable kraft. Signals rest securely in the transparent pocket tips.

A telephone record specialist

The Kardex Telephone and Telegraph Sales Department is a group of specialists. These men are thoroughly familiar with the specialized records of a telephone company. Their wide experience is at your disposal unreservedly. Write this department direct. It will serve you well.

Telephone & Telegraph Sales Department

Remington Rand Business Service *Inc.*

Remington Rand Building **Buffalo, N. Y.**

With the Manufacturers and Jobbers

Plant Accounting Forms Devised by Coffey System & Audit Co.

The announcement by the Coffey System & Audit Co. of its new plant accounting forms is being received by Independent telephone companies with much interest. For many years, one of the most discussed questions in the telephone industry has been the proper accounting for plant operations and depreciation.

The Interstate Commerce Commission, after a decision made January 2, 1926, issued an order, No. 14700, pertaining to depreciation charges for telephone companies and the classification of telephone property. This order was to become effective January 1, 1928, but was posptoned indefinitely.

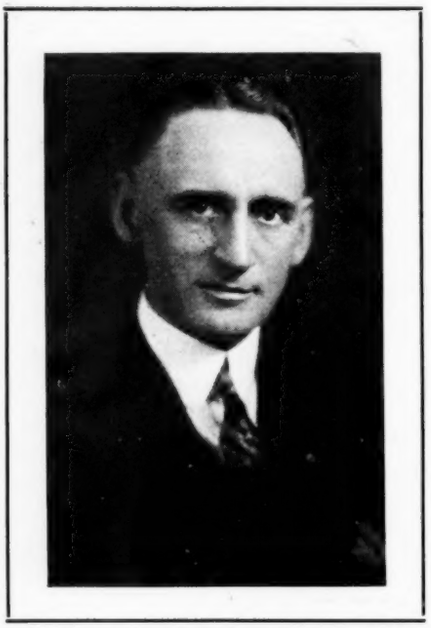
Although the order may not become effective for some time, it has awakened the telephone companies to the importance of proper plant accounting which reflects upon depreciation. This is evidenced by the numerous requests received by the Coffey System & Audit Co. for forms to record such operations as material used, plant displaced, material salvaged, material on hand, employes' time distribution, etc. To meet the demand of the telephone industry, the Indianapolis accounting organization has completed a set of plant accounting forms which may now be obtained.

The Coffey System & Audit Co. was founded by John W. Coffey, certified public accountant and pioneer in the Independent telephone industry. When the Interstate Commerce Commission ordered the adoption of the Uniform System of Accounts by class A companies on January 1, 1913, and classes B and C companies on January 1, 1915, Mr. Coffey, through his expert accounting training and his familiarity with telephone operations, devised the "Coffey System of Telephone Accounting," a simple and thorough system of accounting for telephone companies.

This system became popular among telephone companies and has been endorsed, it is stated, by state commissions and other officials supervising public utility corporations. Under the leadership of Mr. Coffey, the Coffey System & Audit Co. has attained international prominence; telephone companies in Mexico and South America are numbered among the "Coffey System" clientele.

The next step adopted by the Coffey System & Audit Co. to assist Independent telephone companies was the inauguration of a central accounting department. After the uniform system of accounts was made compulsory upon telephone companies, a situation arose among many companies where they could not afford to employ a bookkeeper, or where they could not obtain competent help to keep their books. In many cases, the managers did not desire the responsibility of keeping records minutely supervised by the Interstate Commerce Commission or state public service commission.

To solve this situation, the "Coffey System" central accounting department came into existence. This department was devised to keep the books, other than the subscribers' records, in the Coffey company's Indianapolis office. The "Coffey System" assumed the responsibility of supervising the accounting work of the company and reporting to the commissions annually, as required; it also handled any controversy between the commission and the company and acted as general counselors in the company's accounting problems.



John W. Coffey Has Been Actively Identified with the Coffey System & Audit Co. for More Than 20 Years.

The central accounting department plan became so successful that today the department is keeping the books of telephone companies located in 18 states of the Union.

In addition to the extensive practice the organization has enjoyed as auditors and accountants, the Coffey System & Audit Co. has played an important part in preparing testimony for rate cases, mergers and sales. Since the organization specializes in telephone matters, members of the "Coffey System" have frequently been called upon as expert witnesses at rate case and merger hearings before commissions and other judicial bodies.

Consistent with its policy of solving the accounting needs of Independent telephone companies, the Coffey System & Audit Co.'s recently completed plant accounting forms which are expected to be of valuable assistance to the industry. By the use of the plant accounting forms, it is stated that it is possible to eliminate guesswork or estimated figures in dealing with plant additions, charges to depreciation and ordinary maintenance charges.

The plant accounting system consists of five forms which are easily understood. They were devised after a comprehensive study of the needs and facilities of many telephone companies of various sizes, and contain the account numbers of classes A, B and C telephone companies. Sample forms will be sent upon request to those telephone companies interested, is the announcement made by A. D. Shamberg of the Coffey System & Audit Co., Peoples Bank Building, Indianapolis, Ind.

Vacation Plan of Automatic Electric Inc. Proves Success.

Although considered by some to be an unwise or at least a doubtful experiment, the uniform vacation plan originated by Automatic Electric Inc. and placed in effect for the first time this year, turned out to be a distinct practical and economic success, the indications being that the same plan will be followed in future years.

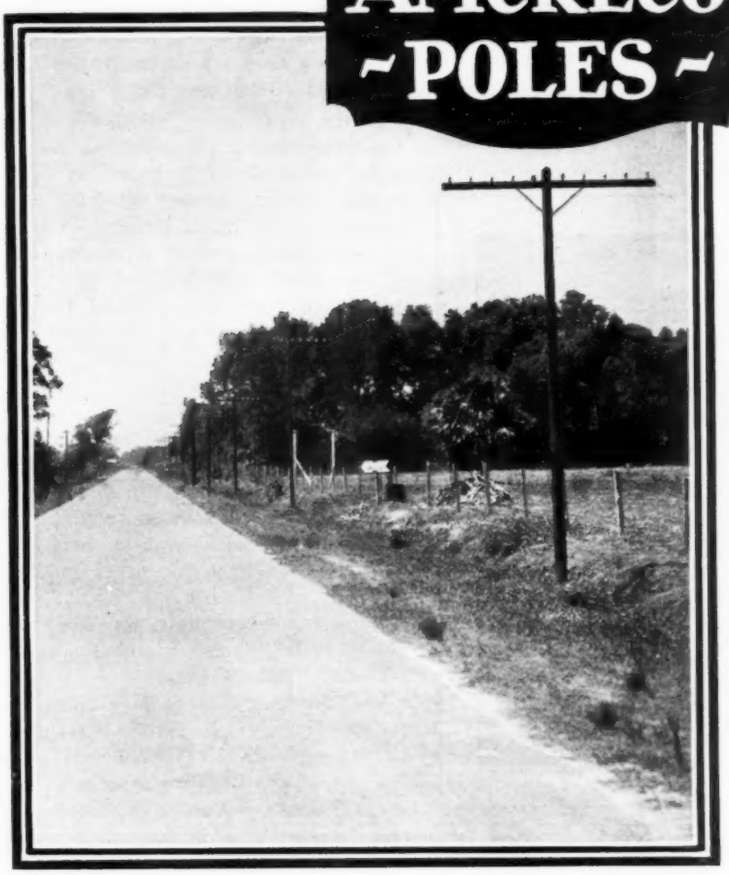
Briefly this plan provided for the closing down of the offices and manufacturing plant of the company for two weeks during August, all employes with a few isolated exceptions being required to take their usual vacations during the same two-week period.

Consideration of the idea originated primarily with the difficulties encountered in former years in maintaining established production and delivery schedules during the summer months, when the personnel of the company is depleted by numbers of employes being on vacations or leaves of absence at various times.

Obviously, production schedules based on complete personnel were extremely difficult to live up to under such conditions, and it was equally difficult to lay out accurate schedules based on a depleted personnel. It was obvious also that to maintain a complete personnel during the entire year, with the exception of one two-week period, permitted the establishment and maintenance of uniform schedules during this entire working period.

These advantages proved to be of particular value to the company's customers in avoiding delays and disappointments in deliveries. Another advantage, of more direct value to the company itself, was

AMCRECO ~POLES~ *resist destruction by insects*



DAMAGE to poles caused by the attacks of white ants or termites is no longer limited to semi-tropical countries. Instances are now fairly common of the appearance of these insects in the United States, particularly in the central and southern states.

If your poles are Amcreco creosoted southern yellow pine, you need have no fear of these destructive pests. The pure creosote oil with which these poles are deeply impregnated makes them impervious to such attacks.

While the full length pressure treatment used in Amcreco plants is primarily used to prevent decay of the wood, it has been demonstrated to be the most effective protection against the insects referred to above and is also repellant to woodpeckers and similar birds.

The presence of the oil in the wood acts as a fire retardant. The surface is quickly charred and the fire goes out without seriously damaging the pole.

Specify Amcreco poles and get these and other advantages. Ask for quotations.

SALES OFFICES

332 So. Michigan Ave.
Chicago

350 Madison Ave.
New York City

401 W. Main St.
Louisville, Ky.

Brunswick, Ga.

Bogalusa, La.

AMERICAN CREOSOTING COMPANY
INCORPORATED

COLONIAL CREOSOTING COMPANY INCORPORATED

AMCRECO LOWRY PROCESS CREOSOTED WOOD

GEORGIA CREOSOTING COMPANY INCORPORATED

LOUISVILLE ~ KENTUCKY

T-8-8-Gray

When writing to American Creosoting Co., please mention TELEPHONY

that it was unnecessary to employ temporary clerical or other personnel to fill in the gaps in the office force during the summer months.

To make sure that this plan would work to the greatest benefit of both the company and its customers, letters were mailed out at intervals previous to the closing down period asking the company's customers to bear the shut-down period in mind and advising them that no manufacturing and no shipments, other than those of an emergency nature, would be made during those two weeks.

To take care of these emergency activities it was necessary to retain a skeleton organization of one or more employes in each department, except in the factory proper, so as to insure the taking care of all urgent business. This was particularly true of the sales department, being the main point of contact between the company and its customers and prospects. In fact, all sales activities and negotiations were continued substantially as during ordinary times.

Everything considered, the plan seemed to measure up to all expectations and there is every indication that it will be followed in the same manner in future years.

Booklet Gives Technical Discussion of Wood Preservative.

"A Technical Discussion on Zinc Meta-Arsenite," is the title of a new booklet issued by The Curtin-Howe Corp., timber preservation engineers. Zinc Meta-Arsenite is the wood preservative developed by the Western Union Telegraph Co., for its own use and now being handled commercially by the Curtin-Howe Corp.

The booklet is made up of three sections. Part 1 is entitled "Chemical Reaction of Wood Destroying Fungi." This was an address before the American Wood Preservers' Association at Montreal last January by Dr. Leo Patrick Curtin, chemist of the Western Union Telegraph Co.

Part II entitled "Chemistry and Toxicity Data" was prepared by Dr. Curtin as a supplement to Part 1.

Part III. "Weathering and Field Tests," is a paper presented before the American Woodpreserver's Association at Montreal last January by Paul J. Howe, construction engineer, Western Union Telegraph Co.

Pole users will be interested in this discussion of a preservative said to produce a clean and cheaply preserved pole. Copies of the booklet may be obtained upon application to the Curtin-Howe Corp., 11 Park Place, New York City.

Pedley Now With Sales Division, Highway Trailer Co.

W. S. Pedley, formerly with the Southwest Telephone Co., Little Rock, Ark., has been appointed sales manager of the public utilities division of the Highway Trailer Co., Edgerton, Wis. He is back again in his native state and known to the public utility field in the Northwest. His 18 years of active service in various phases of the telephone industry give him an exceptionally broad background of experience for efficiently carrying out his present responsibility.

Mr. Pedley will have his headquarters at the factory and from there he will direct

W. S. Pedley, with 18 Years' Experience in Telephone Field, Is Now Sales Manager, Public Utilities Division of the Highway Trailer Co., Edgerton, Wis.

and promote sales activities of the Highway Trailer Co. in the public utility field.

His many friends will be pleased to learn of his new association with a company which is fast becoming widely known in the utility field. "Wes" expects to continue the many personal contacts he has in the field and will also be present at the conventions.

Strowger Automatic Telephones Installed at Wilpshire, England.

With the opening on Saturday, August 25, of a new telephone exchange at Wilpshire, England, in the Blackburn area, another link has been added to the chain of Strowger automatic telephone exchanges inaugurated by the British Post Office.

A parish of some three miles to the north of Blackburn with a population at the last census of less than 2,000, Wilpshire subscribers are now accorded the same privileges and enjoying the same service that their near neighbors in Blackburn proper have experienced since 1916, the town being one of the earliest in the provinces to be converted to automatic working.

Blackburn is one of the centers of the Lancashire cotton industry, its specialty being weaving. The place dates back to the 6th century and was for some time the chief town of a district known as Blackburnshire. It ranked as a flourishing market down in Elizabethan days, and about the middle of the 17th century became famous for its "checks," afterwards superseded by a similar linen and cotton fabric known as "Blackburn greys."

In the 18th century, Blackburn became the theater of textile invention, and the ability of certain of its natives in this direction greatly fostered the local cotton industry. Thus James Hargreaves invented his "spinning jenny" there, about 1764; but the local operatives, fearing a consequent reduction in the demand for hand labor, forced him to quit the town, to the advantage of Nottingham, where he subsequently succeeded in perfecting his invention.

At the time, Hargreaves was in the employ of Robert Peel, grandfather of the prime minister of that name, who instituted the factory system in Blackburn, and as the director of a large business, carefully fostered improvement of industrial methods.

Blackburn lies in the valley of a stream known in early times as the Blackeburn, and now called the Brook.

The Strowger automatic exchange installed there for the British Post Office in 1916 by Automatic Telephone Mfg. Co., Ltd., has now grown to a capacity of 3,400 lines, serving a population of some 130,000, and the new Wilpshire exchange, installed by the same company, will work in conjunction with it. The initial capacity of the Strowger exchange at Wilpshire is 275 subscribers and 25 coin-box lines, with an ultimate capacity of 400 lines.

Three line-switch units comprise the major portion of the equipment and upon them is mounted the whole of the apparatus with the exception of the repeaters, which are accommodated on a separate rack, and the meters, which are carried by a one-day meter rack.

Only the incoming third and final selectors are located in the Wilpshire exchange, the first and second group selectors; outgoing auto-to-auto repeaters and test offering relay group being accommodated in the main exchange at Blackburn.

The system is five-digit, with fourth wire reverse battery metering, and the numbering scheme is as follows:

P.B.X. subscribers	48,000-48,089
Ordinary subscribers	48,100-48,169
Ordinary subscribers	48,200-48,299
Coin box lines	48,190-48,199
Junction and trunk records	0
Phonograms	90
Inquiries	91
Test clerk	99

Following the customary smoothness and efficiency which characterizes the important transfer of large numbers of subscribers from the old system to the new under the Post Office organization, the cut-

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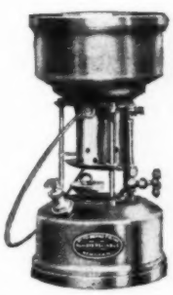

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over of Wilpshire to Strowger operation took place without a hitch at 2 p. m. on Saturday, August 25, and its subsequent working was as effective as that of the original Blackburn network of which it now forms a part.

Radio Corporation to Compete for Picture Transmission Business.

The method of synchronizing sending and receiving disks used in radio television developed by engineers of the Westinghouse Electric & Mfg. Co. will be one of the main features in apparatus which will be soon put into use by the Radio Corp. of America in transmitting and receiving facsimile messages and pictures between numerous points in the United States.

When arrangements have been completed, the Radio corporation will be enabled to handle facsimile and picture business between numerous points ranging from Europe to the Far East. The company is already handling the transmission of pictures and facsimile messages between Europe and New York and between San Francisco and Honolulu, and the new apparatus will enable the service to be extended across the United States and the entire way across the Pacific.

While it has not been announced when the new process will be put into commercial use, it is believed that the apparatus will be ready for service to a number of points before the end of this year. The main circuit will be between New York and San Francisco direct, and other circuits will be provided between New York and San Francisco via Chicago. A further link will connect New York and New Orleans. All the main cities reached will be hooked up with nearby important cities in their section of the United States.

This development follows closely upon the contracts by which the Western Union Telegraph Co. and the Postal Telegraph & Cable Corp. among other things obtained the right to use the American Telephone & Telegraph Co.'s telephoto service throughout the United States, and indicates that there will be keen three-cornered competition for this sort of business.

Although telephotography and television are still in their infancy as regards either speed or accuracy, there has to date been practically perfect transmission of pictures by wire by the slower methods and instantaneous transmission by a method which gives hazier pictures. The new Radio corporation apparatus, developed in cooperation with Westinghouse engineers, is reported to have bridged to some extent these two extremes.

The Radio corporation has not heretofore been engaged in the communications business in continental United States, so that the new plans, when completed, will represent a new departure for the organization. Developments may be interesting.

What the Commissions Are Doing

Up-to-the-Minute News Regarding the Activities of State and Interstate Commissions, Courts and City Councils in Matters Concerning Telephone Companies—Summary of Commission Orders and Schedule of Telephone Hearings

Interstate Commission Places Tentative Valuation of Postal.

The Interstate Commerce Commission on August 29 placed a tentative valuation for rate-making purposes of $20,603,725 on the used property of the Postal Telegraph-Cable Co. and subsidiary companies as of June 30, 1919. The tentative valuation placed on the total owned property of the companies was $868,225, as of the same date.

The total property used but not owned by the company, as listed in the tentative valuation report of the commission, is leased from 43 subsidiary organizations and its value is placed at $19,735,500. These 43 companies constitute the Postal Telegraph system.

The system operation of these telegraph properties is conducted separately from the Mackay company's other activities, which include its operation of cable lines and its dealings in investment securities.

The telegraph lines operated by the Postal aggregate 26,980.29 miles of pole line, 29.94 miles of submarine cable, 186.83 miles of underground conduit, all wholly owned by subsidiary companies in the system, and 1,546.98 miles of pole line and 36.06 miles of underground conduit, owned jointly by such subsidiaries with other companies.

It also uses, but does not own, 5,485.88 miles of wires on poles and 2.45 miles of cable in underground conduit of other companies. Arrangements also are in effect for handling Postal messages on 852.54 miles of poles and wires of other companies.

After careful consideration of all facts, including appreciation, depreciation, going-concern value, working capital and all other matters which appear to have a bearing upon the values reported, the values, for rate-making purposes, of the property of the Postal, owned or used and devoted by it to common-carrier purposes, were found to be $20,603,725, of which $868,225 represented properties "owned" and $19,735,500 represented properties "used," but not "owned."

The sum of $868,225 stated as "owned" is on account of working capital, including material and supplies. No other values or elements of value to which specific sums can be ascribed are found by the commission to exist.

Officials of the Postal Telegraph & Cable Co. announced that a protest would be lodged against the tentative valuation as is allowed under the law.

"The value reported is for the system as it existed nearly ten years ago, and at prices prevailing nearly 15 years ago," a statement issued by the corporation said. "Even based on that period, they fall far short of representing the true value of the Postal telegraph system as at that time. A valuation based on present prices would be still greater in excess of the 1919 figures.

"Furthermore, the tentative valuation omits the value of leases of extensive properties and makes totally inadequate allowances for the value of rights-of-way, going concern, working capital and other elements of value."

Southern Bell Purchase of Homestead, Fla., Property, Approved.

The Interstate Commerce Commission on August 16 issued a certificate that the acquisition by the Southern Bell Telephone & Telegraph Co. of the properties of the Homestead Telephone Co., Homestead, Fla., is found to be of advantage to the persons to whom service is to be rendered and in the public interest. No objection to the granting of the joint application covering the transaction was made at the hearing.

The properties of the Homestead company consist of an exchange at and contiguous to the city of Homestead, Fla., including lines and exchange property connected therewith used in furnishing telephone service to the residents of Florida City; also toll circuits extending from Homestead to the corporate limits of the city of Cocoanut Grove, approximately 25 miles, which are carried on the poles of the American Telephone & Telegraph Co. and connect with the Miami exchange of the Bell company. The company has approximately 300 stations.

On February 16, 1928, the Southern Bell company contracted to purchase all the properties of the Homestead company, free from all liens and encumbrances, for $65,000. An appraisal made by the Bell engineer finds the cost of reproduction new

as $70,000, and loss depreciation $56,148. Certain exchange poles, wires and cables amounting to $805 will be removed as useless. There will be no net salvage in removing this equipment, but there will be a cost of $195, making the total structural value of the plant to be purchased $55,953.

The Homestead company was organized under the laws of Florida and all of its capital stock is owned by F. W. Webster. The record shows that the hurricane of 1926 seriously damaged the plant and, in addition, Mr. Webster met with considerable financial losses. The territory served by the Homestead company is now rapidly developing, resulting in increased demand for telephone service and additional equipment which Mr. Webster is unable to finance.

Homestead is surrounded by exchanges owned and operated by the Southern Bell company and that company proposes to operate the properties of the Homestead company without any change other than maintenance and construction to take care of the growth of service. No changes in rates are anticipated at the present time.

The Southern Bell company states that the price which it proposes to pay for the properties of the Homestead company is fair to both parties. It alleges that with improved service and active management the income from the properties to be acquired will fully justify its purchase as proposed.

The acquisition of the Homestead properties by the Southern Bell company has been approved by the Florida Railroad Commission, the city council of Homestead, and the town council of Florida City. At the hearing communications from a number of representative telephone users were introduced in evidence, all favoring the proposed acquisition.

Citizens' Public Service Co. of Missouri Acquires More Plants.

Purchase of four more telephone properties by the Citizens' Public Service Co. of Missouri, with headquarters at Jefferson City, was authorized on August 22 by the Missouri Public Service Commission, which also granted certificates of public necessity and convenience for the operation of the properties by the company.

The properties authorized to be taken over are:

Exchanges at Elmer and Gifford, in Macon county, with 219 subscribers and 189 rural line subscribers, from J. O. Atteberry, for $20,000 cash.

Exchange at Madison, Monroe county, with 150 subscribers and 350 rural line subscribers, from Fred Lineberry, for $26,000 cash.

Exchange at El Dorado Springs, Cedar county, with 530 subscribers and 200 rural line subscribers, from M. G. Tracy, for $67,500 cash.

These orders make a total of nearly 30 telephone exchanges that have been bought

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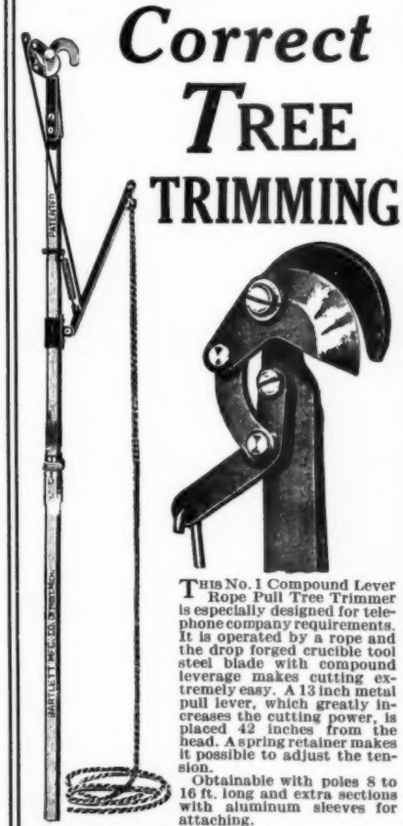

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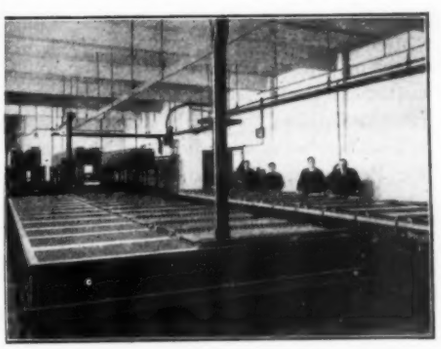

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recently by the Citizens' Public Service Co. of Missouri, and there are deals pending for the acquisition of other similar properties.

Valparaiso, Ind., to Appeal Sale Order to Court.

City authorities of Valparaiso, Ind., and representatives of the Chamber of Commerce are planning to carry on their fight against the sale of the Northwestern Indiana Telephone Co. to the Winona Telephone Co. and the Crown Point Telephone Co. Recently the Indiana Public Service Commission denied an appeal asking for modification of the order issued by Judge E. Norton in the Lake County Circuit Court at Crown Point which approved the sale.

To take this action, the civic interests of Valparaiso plan to employ the same court appeal statute the Winona and Crown Point companies used in over-riding the first order of the public service commission which had denied the sale. The act, passed at the last legislature and signed by Governor Ed. Jackson, has been declared by the attorney general to be unconstitutional, in that it permitted the courts to invade the legislative field and provides that appeals may be taken from any order, decision or determination by the Public Service Commission.

Ohio Central Telephone Co. Collecting Increase Under Bond.

The Ohio Public Utilities Commission has authorized the Ohio Central Telephone Corp., of Wooster, to file a $1,100 surety bond in order that the company may collect increased rates in Morrow county pending final action by the commission concerning protests lodged with the commission against new rates.

The company had planned to put the new rates into effect June 1 last, but the commission, upon receipt of protests, suspended the schedule. In the event the commission rejects the increased rates, the company will be required to refund to its customers the difference between the new rates and those previously in effect.

The bond was filed under provisions of the Pence law which authorizes collection of protested rate increase when a guarantee of refunds is furnished. The bond is intended to cover the increase in rates which became effective September 1.

Council Hearing on Portland, Ore., Franchise of Pacific Bell.

After three days of public hearing on the proposed telephone franchise for Portland, Ore., the city council on August 18 had the franchise ordinance read the first and second times, and set the regular council session date of Wednesday, September 19, as the time for the third reading and consideration of final passage of the ordinance.

Because the ordinance is a franchise, it cannot be considered again for 30 days. When it comes up for final passage at least four members of the council must vote for it before it can be passed and be submitted to the people. The vote of the council on August 18 to overrule all remonstrances and objections, most of which had been made by the telephone company, was unanimous.

Throughout the entire hearings, representatives of the Pacific Telephone & Telegraph Co. maintained their stand that the company could not accept the franchise proposal, which provides for a 25 per cent cut from existing telephone rates. They argued that the city has no right to fix rates, that being a function purely of the state, through the public service commission, and that, besides this, the proposed cut of 25 per cent would wipe out all the profits on the telephone business in Portland, and could not be considered by the company on financial grounds.

Chief of the franchise provisions, in addition to the 25 per cent cut in rates, are: the right to take over the property of the company at a fair valuation; provision for the trimming of trees by city employes only; frequent reports to the city auditor; a declaration that the rates prescribed are fair and reasonable and compensatory; the elimination of advance payments, report and other charges; a charge of 1 per cent on the gross revenues of the company for the city treasury, and provision for telephone service for the police and fire bureaus.

Pay Station Dispute to Be Settled by Oklahoma Commission.

A dispute between Southwestern Bell Telephone Co. and H. F. Wagley of Oklahoma City will be settled soon by the Oklahoma Corporation Commission. Mr. Wagley filed a complaint charging the company with disconnecting service from a pay telephone.

He declared employes of the telephone company left the slot arrangement unlocked and that many telephone users withdrew their nickels after telephoning.

Summary of Commission Rulings and Schedule of Hearings.

INTERSTATE COMMERCE COMMISSION.

September 13: Hearing in Washington on application of the Pacific Telephone & Telegraph Co. for a certificate that the acquisition by it of stock control of the Corona Home Telephone & Telegraph Co., Corona, Calif., by purchase of 4,240.75 shares of its capital stock will be of advantage to the persons to whom service is to be rendered and in the public interest.

September 13: Hearing in Washington on joint application of the Milford Home Telephone Co., Milford, Mich., and the Michigan Bell Telephone Co. for a certificate that the acquisition by the latter company of certain telephone properties of the former company will be of advantage to the persons to whom service is to be rendered and in the public interest.

The property involved consists of 26 stations in the village of Commerce and six stations in New Hudson, Mich., and connecting rural lines, for a consideration of $2,350 cash.

ALABAMA.

August 22: Certificate denied authorizing the New Brockton Telephone Co. to build a telephone line between New Brockton and Elba. It was found that the properties would duplicate the investment of the Standard Telephone & Telegraph Co. The latter company agreed to place an additional circuit within 60 days between Enterprise and Elba.

August 22: Approval granted of the sale of the Lincoln telephone system, properties and rights by W. D. Davis to the South Central Telephone Co.

August 22: Bayou Telephone Co. granted authority to erect, maintain and operate telephone lines near Bayou Labatre, Irvington, Grand Bay, Coden and other nearby territory.

CALIFORNIA.

August 26: Santa Barbara Telephone Co. applied for authority to issue and sell $50,000 par value of its common capital stock at par for cash, and $150,000 principal amount of its general and refunding mortgage bonds, series A, at a price to net it not less than 97 per cent of face value thereof and accrued interest, and to use the proceeds to reimburse its treasury and for construction expenditures.

August 27: Carl G. Bell, operating the Colfax Telephone Exchange in Placer county, authorized to issue a note for $2,500, payable on or before two years from date, with interest at 7 per cent per annum, for the purpose of refunding outstanding note.

ILLINOIS.

September 4: Hearing at Springfield before Commissioner Trovillion in the matter of the proposed advance in rates for service of the Illinois Southeastern Telephone Co. in Mattoon, Oakland, Humboldt, Shelbyville, Tower Hill, Ashmore and Charleston, stated in rate schedule Ill. C. C. No. 2, of the company.

September 5: Hearing at Springfield before Commissioner Trovillion in the matter of the proposed advance in rates for service of the Farmers Fountain Mutual Telephone Co. in Columbia, Waterloo, New Hanover and Valmeyer, Monroe county, stated in rate schedule Ill. C. C. No. 4, of the company.

September 5: Hearing at Springfield before Commissioner Smith in the matter of the proposed advance in rates for service of the Wabash Valley Telephone Co. in Paris, Edgar county, stated in rate schedules Ill. C. C. 2, of the company.

September 5: Hearing at Springfield before Commissioner Trovillion in the matter of the proposed advance in rates for service in Marshall, Clark county, stated in rate schedule Ill. C. C. 1, original sheet 6. filed by the company.

INDIANA.

August 28: Hearing held on the petition of Versailles citizens for permission to construct lines and become patrons of the Farmers Telephone Co., which recently established an exchange outside the corporate limits of Versailles.

KANSAS.

September 7: Hearing at Hillsboro on application of the Central Kansas Telephone Co. for permission to change its rates for service at Hillsboro.

September 10: Hearing at Topeka on application of the Western Telephone Corp. to sell its telephone plant and prop-

erty at Ellis, to the Ellis Telephone Co.

September 10: Hearing at Topeka on application of the Nickerson Telephone Co. to sell its plant and property to the Western Telephone Corp.

September 10: Hearing at Topeka on application of the Western Telephone Corp. for a certificate of convenience and authority to transact a business of a telephone utility at Nickerson.

September 10: Hearing at Topeka on application of the Ellis Telephone Co. for a certificate of convenience and authority to transact a business of a telephone utility at Ellis.

September 14: Hearing at Abilene on application of the United Telephone Co. for permission to make certain changes in its rates for service at Abilene.

September 21: Hearing at Lindsborg on application of the United Telephone Co. for permission to make certain changes in its rates for service at Lindsborg.

September 25: Hearing at Oskaloosa on application of the American Telephone Co. for permission to make certain changes in rates for service at Oskaloosa.

September 27: Hearing at Goff on application of the American Telephone Co. for permission to make certain changes in its rates for service at Goff.

MINNESOTA.

September 6: Hearing in St. Paul on application of Tri-State Telephone & Telegraph Co. for approval of purchase of a majority of the capital stock of the Greenfield Farmers Telephone Co. from George K. Gann and Roy F. Wilder.

September 13: Hearing in Myrtle on joint application of Myrtle Cooperative Telephone Co. of Myrtle to sell, and of the Tri-State Telephone & Telegraph Co. to purchase, all the physical assets of the Myrtle company. Merger of the property with the Glenville exchange of the Tri-State company is contemplated with the placing in effect of the Glenville rate schedule.

September 17: Hearing on application of New Richland Telephone Co. for increased rates at New Richland and Waldorf. On August 24 the commission ordered that the case be reopened and set down for rehearing in the village of New Richland, for the introduction of additional evidence, further investigation, and examination of evidence already introduced and the consideration of such other matters as may properly be presented at such a hearing.

September 19: Hearing at Proctor in the matter of the application of the Northwestern Bell Telephone Co. for authority to change and increase its rates for exchange service of the Proctor exchange.

MISSOURI.

August 22: Citizens Public Service Co., of Missouri, Jefferson City, authorized to purchase exchanges at Elmer and Gifford for $20,000; exchange at Madison for $26,000; exchange at El Dorado Springs for $67,500.

OHIO.

August 31: Order issued authorizing the purchase of the Lorain County Telephone Co. by a newly-organized company known as the Lorain Telephone Co., for a consideration of $1,570,410.23. The previous order of the commission fixed the value at $1,411,000, but this valuation was revised after a hearing.

Payment will be made with 21,000 shares of no par value common stock at $4.30; $1,000,000 in first mortgage 5 per cent bonds at par, dated June 1, 1928, and $480,000 in 6 per cent preferred stock. Authority was also granted the purchasing company to issue $120,000 of preferred stock in order to finance to a certain extent projected improvements and betterments to cost $144,057.

September 26: Hearing on application of Ohio Central Telephone Co. of Wooster for a new rate schedule for Morrow county.

OKLAHOMA.

September 4: Hearing on application of Kiowa Telephone Co. to route telephone calls between Pittsburg and Savanna direct.

VIRGINIA.

September 4: Hearing on application of Chesapeake & Potomac Telephone Co. relative to increased rates at Lebanon and Honaker.

WISCONSIN.

August 17: Supplementary order issued in the matter of the application of the Wise Telephone Co., Madison, for authority to issue common stock and first mortgage bonds. The temporary value of $60,000 (TELEPHONY, May 19, 1928) for the properties of the Hayward Telephone Co. and Stone Lake Telephone is confirmed after the commission's engineers appraised the properties. Therefore the commission declares no amount of additional securities may be authorized. The commission consents to and approves the consolidation of the companies, but specifies that the Wisconsin Telephone Co. shall not acquire or in any manner take over the properties and shall not place such properties on its books except at a value not to exceed the amount of $60,000.

August 30: Hearing at Melvina on petition signed by R. G. Lahm and others of Melvina asking a permit be given to establish a separate telephone system in that section of the county.

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Condensed Telephone News

Officers of Companies Are Urgently Requested to Forward to Us Promptly All Financial and Other Statements as Soon as Issued and Any Items Relating to Construction, Rebuilding, or Changes in Their Plants and Systems

Franchises.

WELLSVILLE, OHIO—Concluding a year or more of negotiations, the city council here recently approved the Ohio Bell Telephone Co.'s franchise under suspended rules. Plant workmen have begun operation on the elimination of old poles and installation of new ones in the west end of the city.

Financial.

COLUMBUS, OHIO.—Papers have been filed with the secretary of state increasing the authorized capital of the Star Telephone Co., of Ashland, from $1,000,000 to $1.250,000. The new issue of stock is to be composed of 20,000 shares of common stock with $50 par value and 2,500 shares of preferred stock with $100 par value. S. H. Grabill is president and Charles W. Good, secretary of the company.

OAKFIELD, WIS.—Articles have been filed showing that the Oakfield Telephone Co. has increased its capital stock from $13,000 to $35,000 and is increasing the number of its $100 par value shares of stock from 130 to 350. The articles were signed by William H. Crumb, president, and O. A. Blackwood, secretary.

Construction.

CAMBRIDGE, ILL.—Linemen employed by the Citizens Mutual Telephone Co. of Cambridge have finished rebuilding lines leading from Cambridge east along the state road, where the state is now building a paved highway.

This line was formerly owned by the subscribers along the road, who were connected to the party line. The line was in need of repair and the Cambridge company agreed to rebuild it, furnishing poles and renting pin space to the former company, composed largely of farmers along the road.

SPARTA, ILL.—The Sparta Telephone Co. plans extensive improvements of its local system.

CHURUBUSCO, IND.—Work of rehabilitation at the Churubusco exchange of the the Home Telephone & Telegraph Co. is practically completed, it was announced last week by Harry E. Gray, general plant superintendent. All grounded lines have been made metallic, deteriorated wires have been replaced, new poles have been set.

FORT WAYNE, IND.—The work of engineering for necessary rehabilitation at the Roanoke exchange of the Home Telephone & Telegraph Co. is practically completed, and actual reconstruction soon will be started. Deteriorated iron wire and cable is to be replaced and other work will be done to bring the plant up to its highest efficiency.

The operating quarters at the Roanoke exchange already have been enlarged, and a new main frame on which the outside lines are connected has been installed.

The work of replacing poles and wire at the Leo and Huntertown exchanges of the Home Telephone & Telegraph Co. has been completed, it has been announced by Harry E. Gray, general plant superintendent. Both plants are now in condition to give a high grade of service.

HARLAN, IND.—A new cable plant and a new main frame at the central office of the Harlan exchange of the Home Telephone & Telegraph Co. was cut into service last week.

The cut-over represents the completion of an extensive program of habilitation instituted by the Home Telephone & Telegraph Co. shortly after it took over the Harlan plant.

All grounded circuits in the Harlan exchange have been made metallic, deteriorated wire circuits have been replaced with new wire, and the aerial open wire has been replaced by aerial cable.

The Harlan plant can now serve the telephone users in a highly efficient manner, General Plant Superintendent Harry E. Gray of the Home company, stated.

LAPORTE, IND.—With the installation of cable in its new north side underground conduit system, the LaPorte County Indiana Telephone Co. has completed a two-mile project which puts LaPorte's telephone wires underground from the extreme southern limits to the northern limits, according to E. L. Cline, president and general manager of the company.

The local manager intends to lay down conduits eventually that will care for the eastern part of the city, as the north, south and west portions are well taken care of now. The improvement has been made already as far east as the Indiana Moulding & Frame Co. plant.

NEW HAVEN, IND.—Automatic equipment for installation in the New Haven exchange of the Home Telephone & Tele graph Co. was shipped on August 30, and installation of the equipment is expected to be completed before December 1. The equipment to be installed is practically the same as that in use in Fort Wayne. Its installation will require a regrouping of lines in the exchange with only ten subscribers on any one rural line.

Open wire in the town will be replaced with aerial cable and a number of circuits in the rural district will be changed from iron to copper. All the telephones now in use will be replaced with dial instruments.

RISING SUN, IND.—The regular summer program of overhauling the lines of the Ohio River Telephone Co. is in progress. Since the first of the year over 20 miles of pole line in the Vevay exchange area have been gone over.

New poles have been placed, trees have been trimmed, wires tightened, and the line given a general cleaning up. Recently the line force has been working in Rising Sun, removing poles and wires from Main street and rearranging the lines.

This work is similar to that done in Vevay last year. The line crew also is now working in Florence, where new cables are being installed to replace the present open-wire lines. Following this work a general overhauling of the form lines in the Florence exchange will be made.

SHIRLEY, IND.—W. W. Thomas, manager and owner of the Commonwealth Telephone Co., has bought a new two-position switchboard for the local exchange. A new ringing machine, rheostat and batteries have already been installed and the new switchboard will be ready for use by the first of the year. Several other improvements are contemplated for this plant.

GUTHRIE CENTER, IOWA.—On the night of August 25, the old switchboard telephone service here was cut off, and a new board placed in service. Over 450 new telephones have been installed in the town districts with approximately the same number of rural subscribers, making a total of over 900 subscribers served by the Guthrie Center office.

WASHTA, IOWA.—Cutover of all telephone lines in Washta to the underground cable has been accomplished by the crew employed by the Central West Public Service Co. Many country lines have been repaired and rebuilt.

HIBBING, MINN.—Spudville, located southeast of Hibbing, now has telephone service. After several years of waiting, the farmers of the Spudville section, through perseverance, have a complete telephone service, connecting their homes with Hibbing proper and to all points the Northwestern Bell Telephone Co. touches.

SLEEPY EYE, MINN.—With the new Evan line completed, eliminating the Evan switchboard, the patrons there now have direct service with Sleepy Eye. The Sleepy Eye Telephone Co. is rushing work to completion on the new line running south from the Zemler corner, east of town, to Iberia. This new line will be known as the Iberia line. This new line was built to get away from the high line farther east and southeast of town, which has been causing more or less trouble for patrons in that community. The local exchange now has close to 900 patrons.

BETHANY, MO.—The first part of an improvement program for the Bethany telephone plant is being completed. The last of the underground cable in the "first estimate" has been laid and a "second estimate" is to be started soon, probably when all of the first network is put into service. The second part, however, has not been approved definitely by officials of the Middle States Utilities Co., according to R. J. Counts, construction foreman in charge of the local job.

FINLEY, N. D.—Improvements in the system of the Steele-Griggs Counties Farmers Independent Telephone Co., have been completed. The new system includes complete metallic circuits in cables for all subscribers. Formerly the circuits were grounded causing considerable trouble during storms.

TIFFIN, OHIO—Steel work has been started on the $85,000 home of Tiffin Consolidated Telephone Co. W. D. Crawford.

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(See page 46)

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manager of the company, announces that about $105,000 will be required to install the latest type of office equipment.

WATONGA, OKLA.—The United Telephone Corp., L. W. Scherer, president, has completed 23 miles of modern toll line between Watonga and Geary. Mr. Scherer has been on the ground personally supervising the improvements. He announces that construction will start immediately on a new toll line between Thomas and Watonga. This will be 28 miles long. These lines replace part copper and part iron lines and will greatly improve the toll service of the company. When these improvements are completed, the company will rebuild the Watonga exchange, making it thoroughly up-to-date.

BENTON, WIS.—J. R. Moffett, manager of the local telephone office, has purchased the J. M. Cottingham home which will be remodeled for the telephone office. Part of the building will be used for residential purposes. The telephone office has been located in the Blende theater building for the past seven years.

Miscellaneous.

QUITMAN, GA.—When W. T. Reeves, in charge of the mechanical department of the Quitman Telephone Co., smelled smoke at noon recently, he took it for granted there must be a fire somewhere, but did not locate it immediately.

A few minutes later, however, he discovered the switchboard was on fire. He began pulling wires and fighting flames and saved the board and three-story building as well, without stopping to turn in an alarm.

The fire was caused by a high tension wire falling across a telephone wire.

BRADFORD, ILL.—The Standard Telephone Co., Chicago, is now owner of the Empire Telephone Co., with exchanges at Bradford, Buda and Neponset. The deal was completed recently through Paul C. Dodge & Co., Chicago, who obtained the option of the stock, and transferred it to the Standard Telephone Co. Possession was given September 1. The company was formerly in the hands of H. C. Tumbleson.

LEWISTON, MINN.—Stockholders of the Mount Vernon and Lewiston and Rollingstone telephone companies have voted decisively to merge those organizations. The merger was planned by representatives of the three companies at a recent meeting at St. Charles.

NAZARETH, PA.—The Lehigh Telephone Co. of Hazleton has purchased the Slate Belt Telephone Co. and will spend $40,000 on improvements at once.

WILLSHIRE, OHIO.—The plant and business of the Willshire Telephone Co. has been transferred to the Celina & Mercer County Telephone Co. On August 6, 90 per cent of the stock of the local company was transferred to the Celina firm, which has also bought the Wren and Ohio City Telephone companies.

The business of the merged telephone concern is carried on from Celina under the direction of Paul Christy as manager. The affairs of the Willshire exchange will be conducted as formerly, with Floyd Morrison as lineman and in supervision of the local exchange.

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